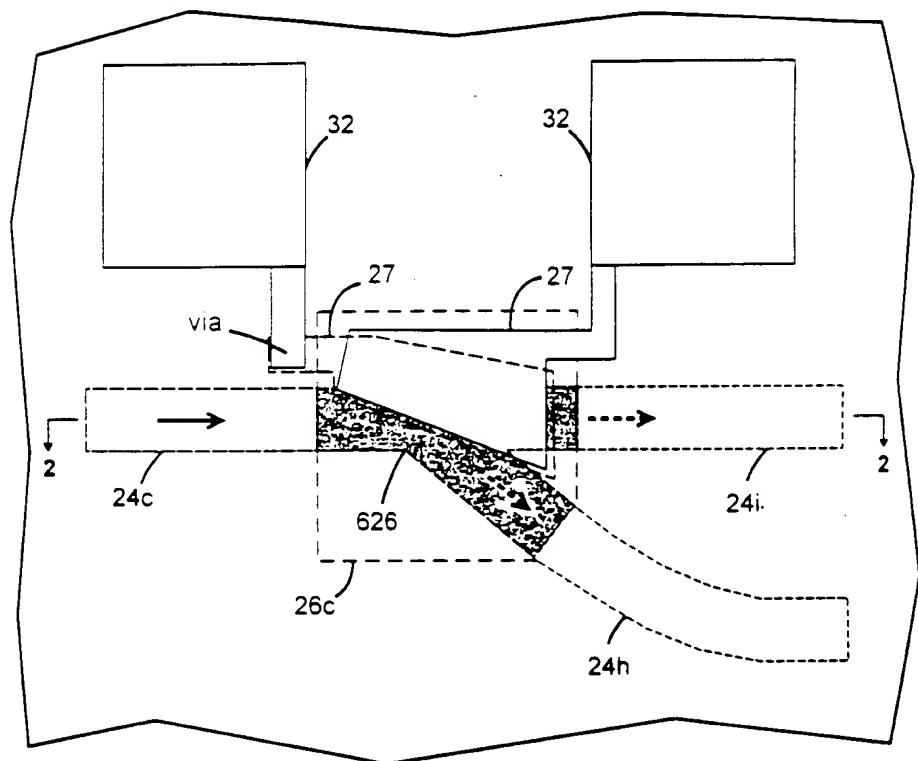
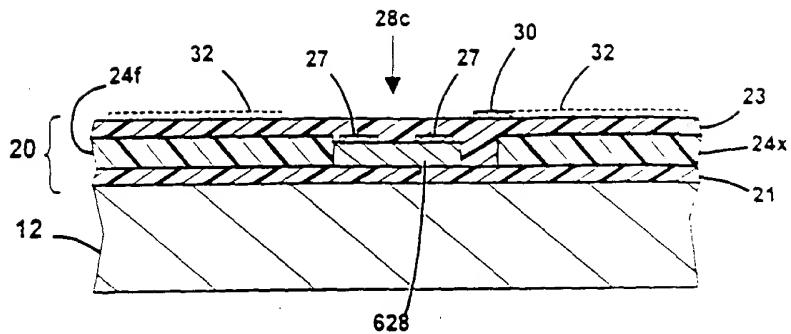


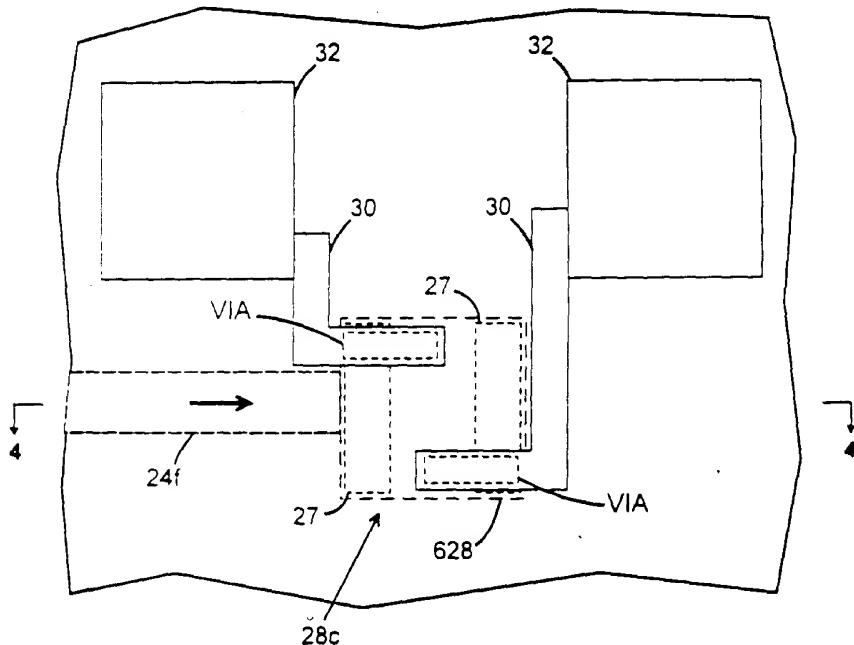
**FIG. 2**



**FIG. 3**



**FIG.\_4-1**



**FIG.\_5-1**

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28c'

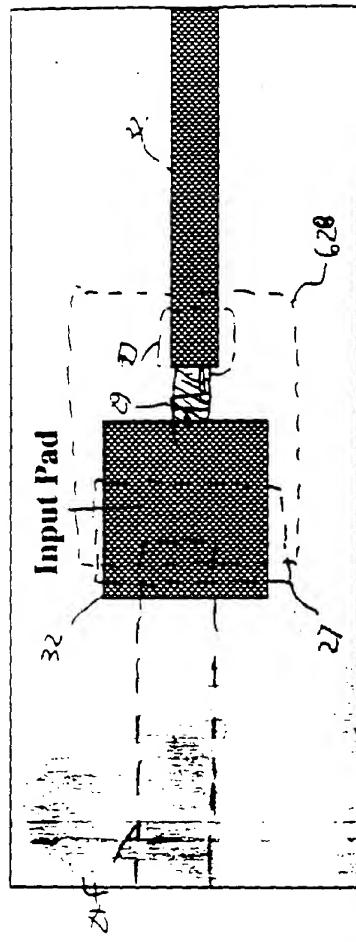


Fig. 5-2

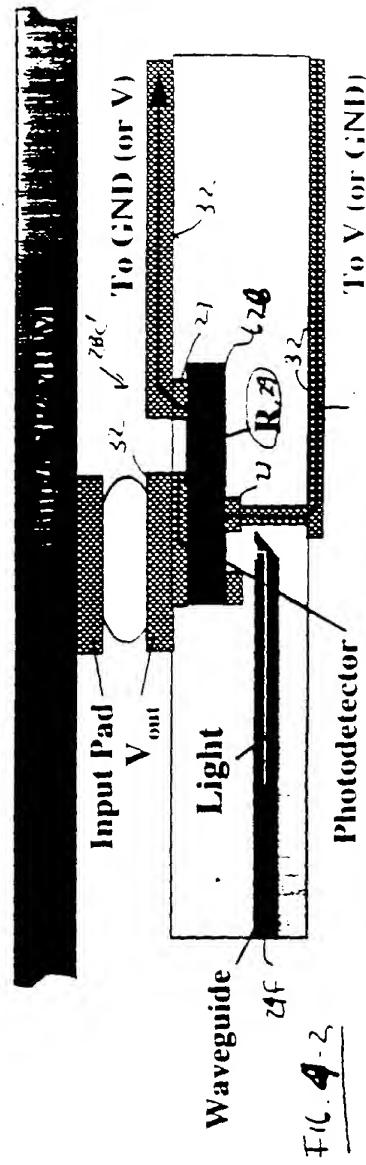
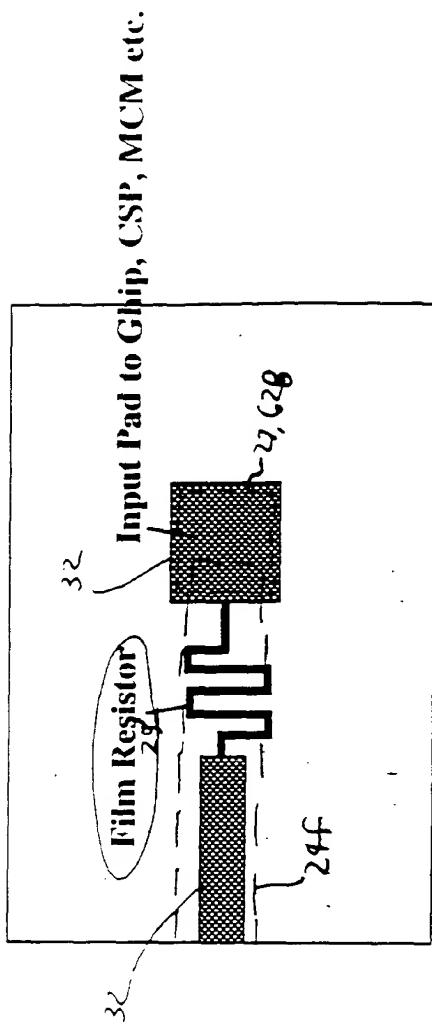
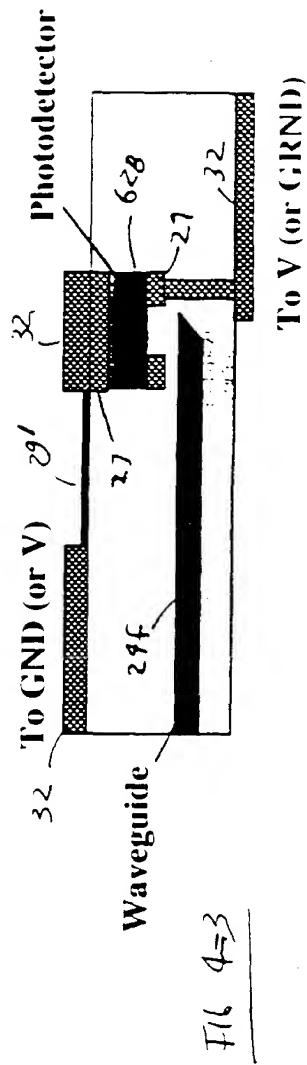


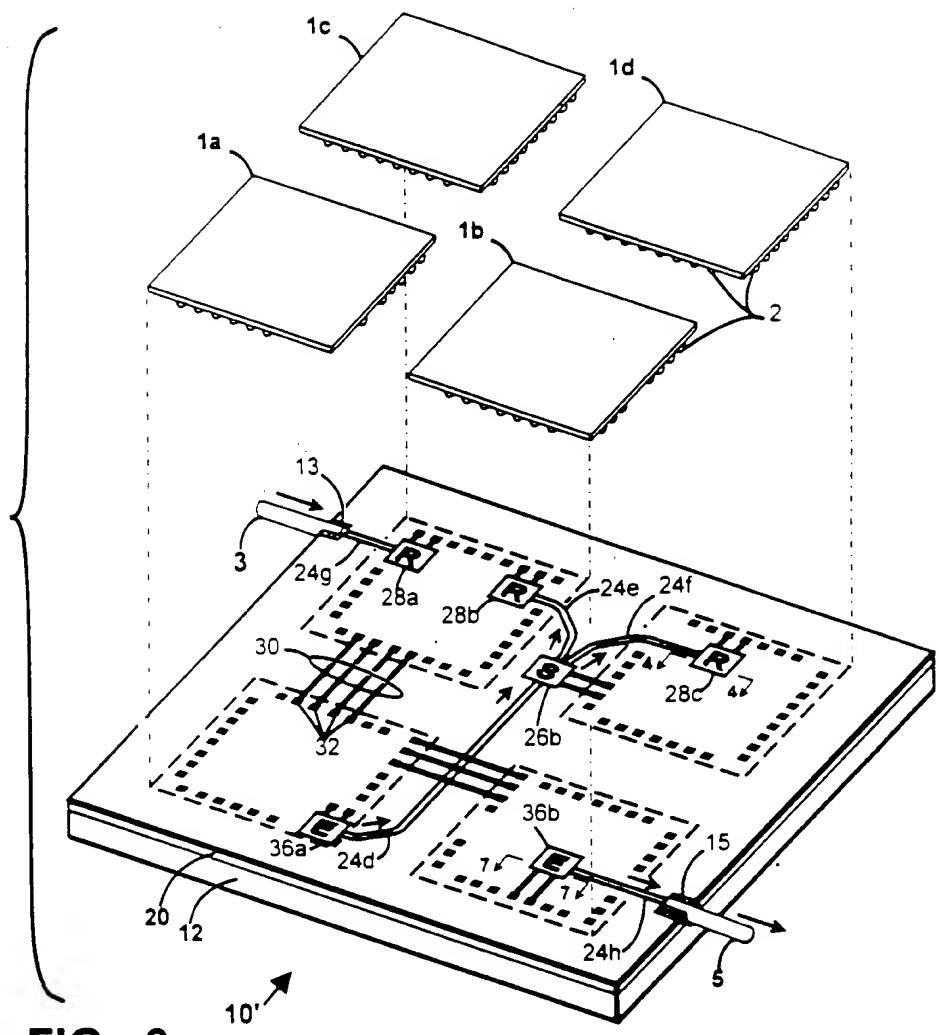
Fig. 4-2



516. 5-3



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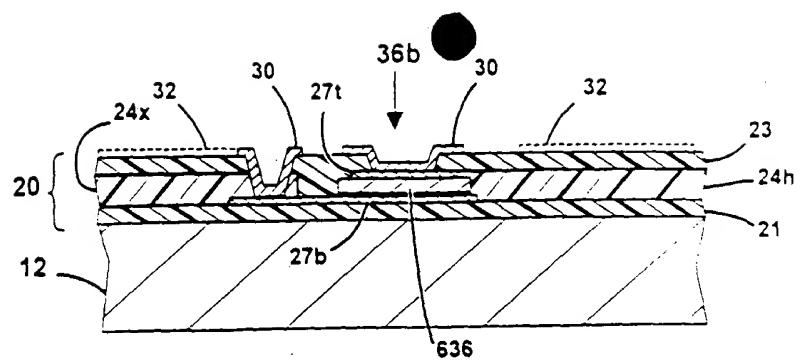


FIG. 7

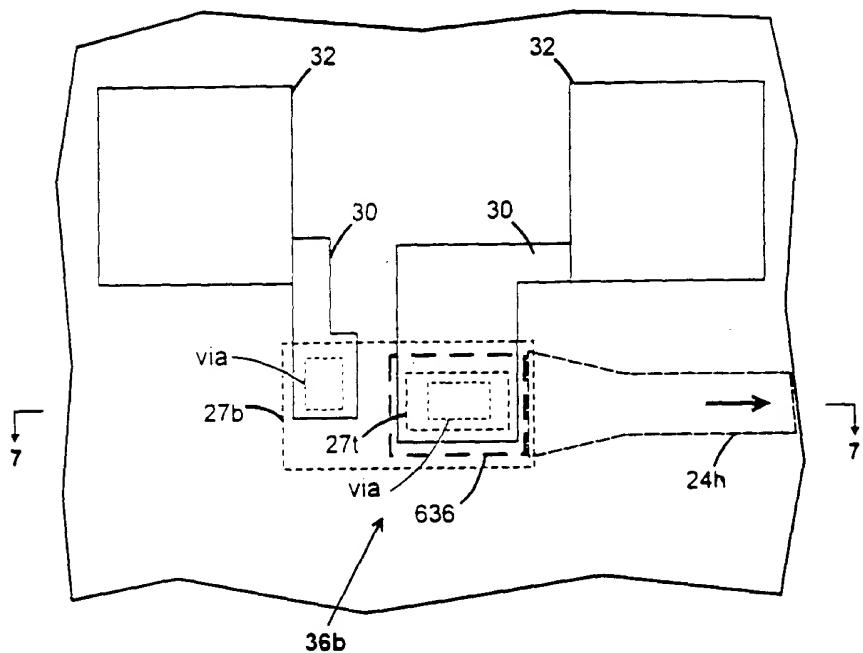
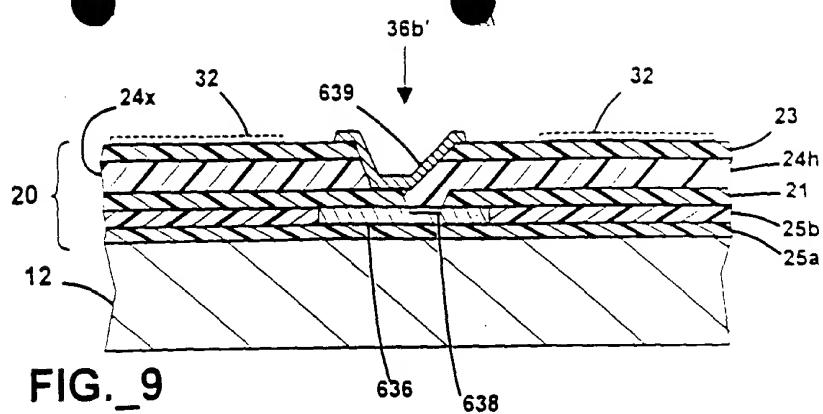
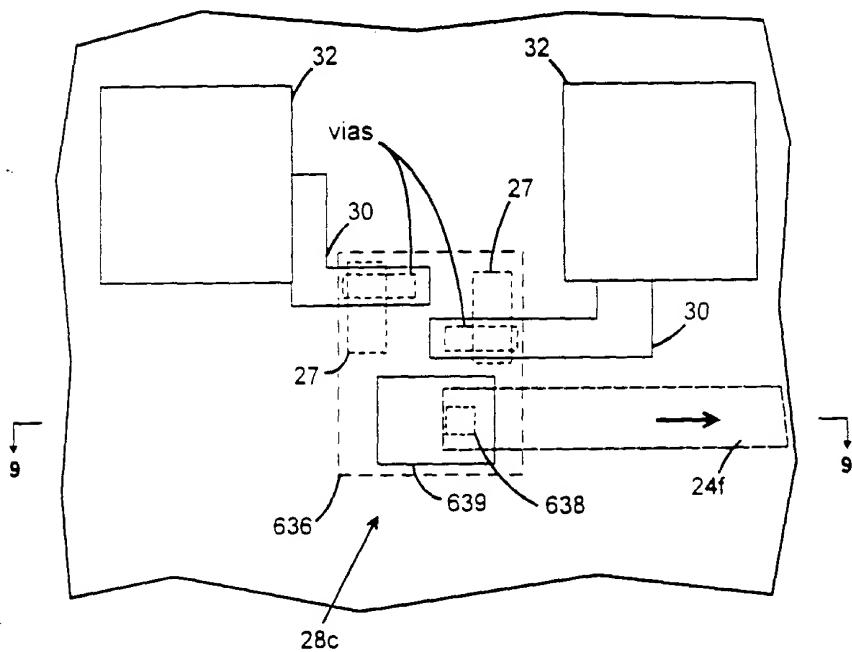


FIG. 8



**FIG. 9**



**FIG. 10**

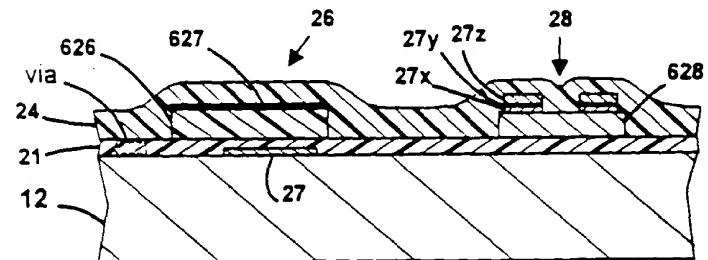
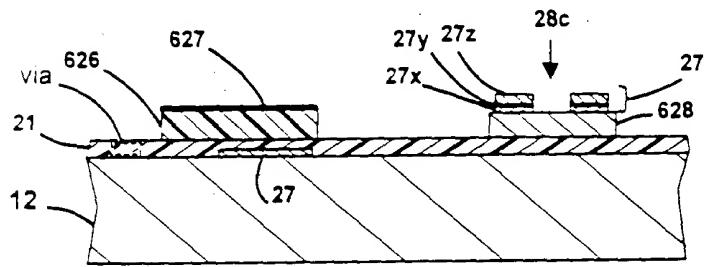
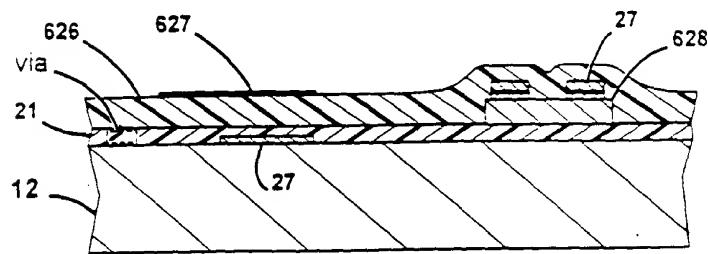
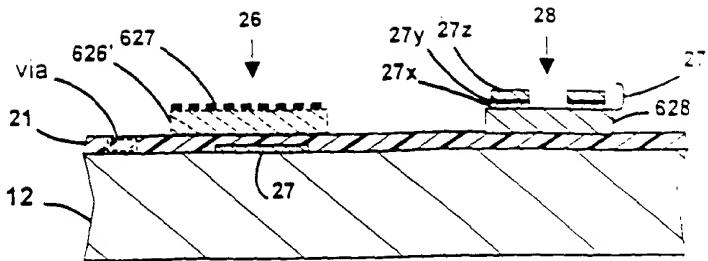


FIG. 15

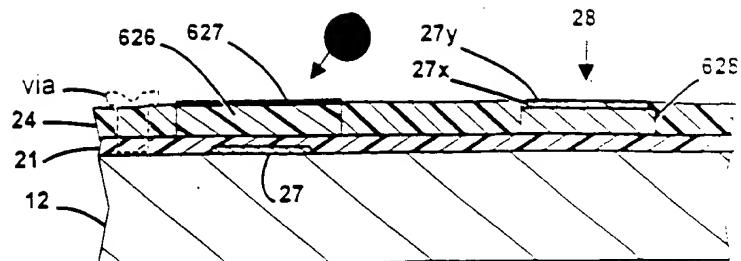


FIG. 16

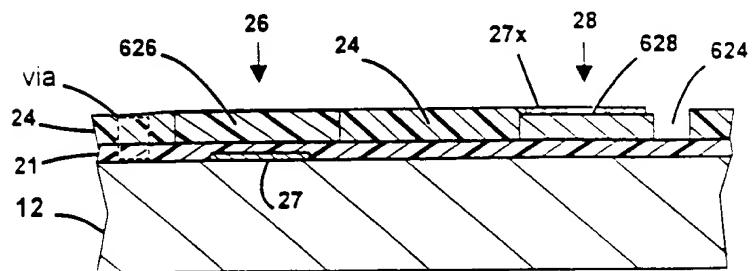


FIG. 17

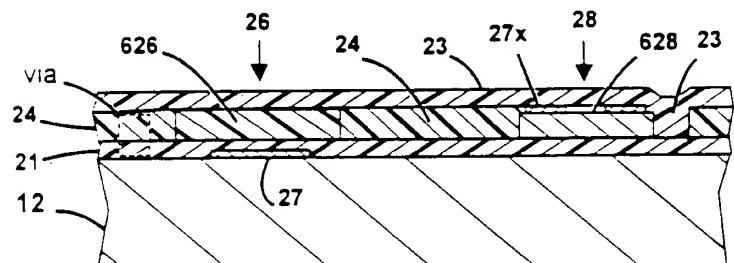
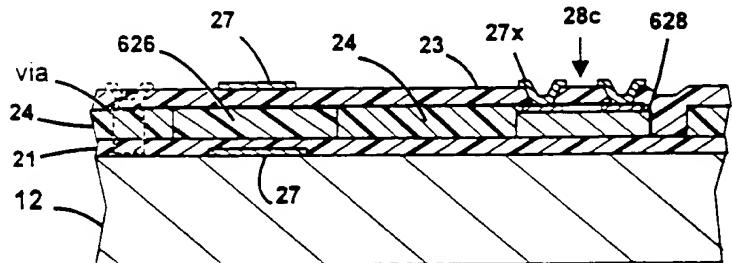


FIG. 18



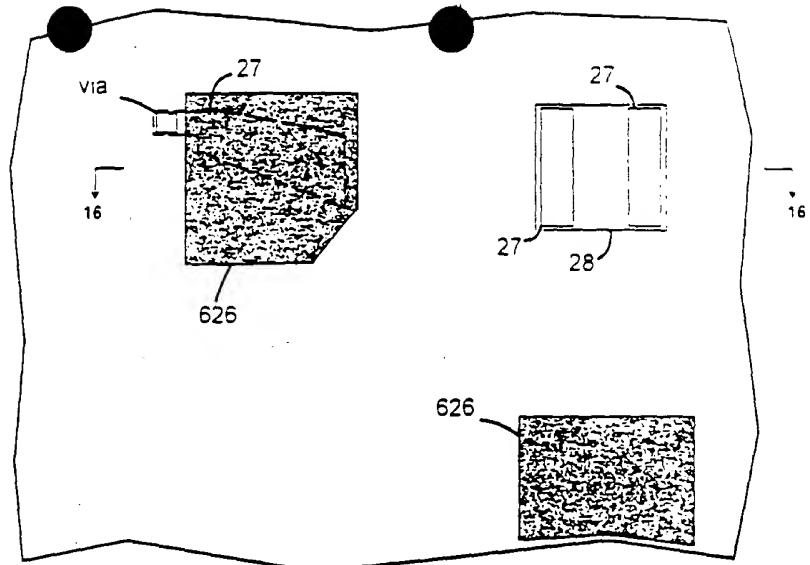


FIG. 19

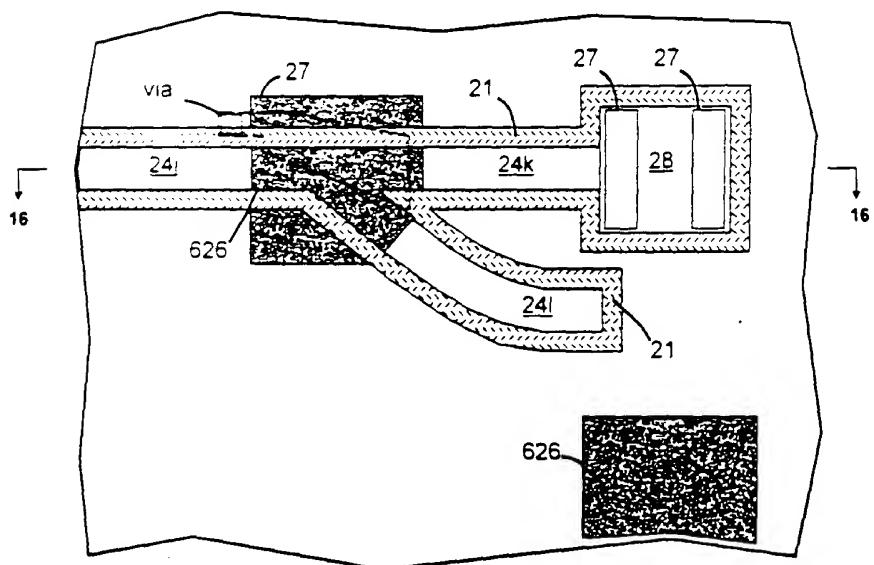


FIG. 20

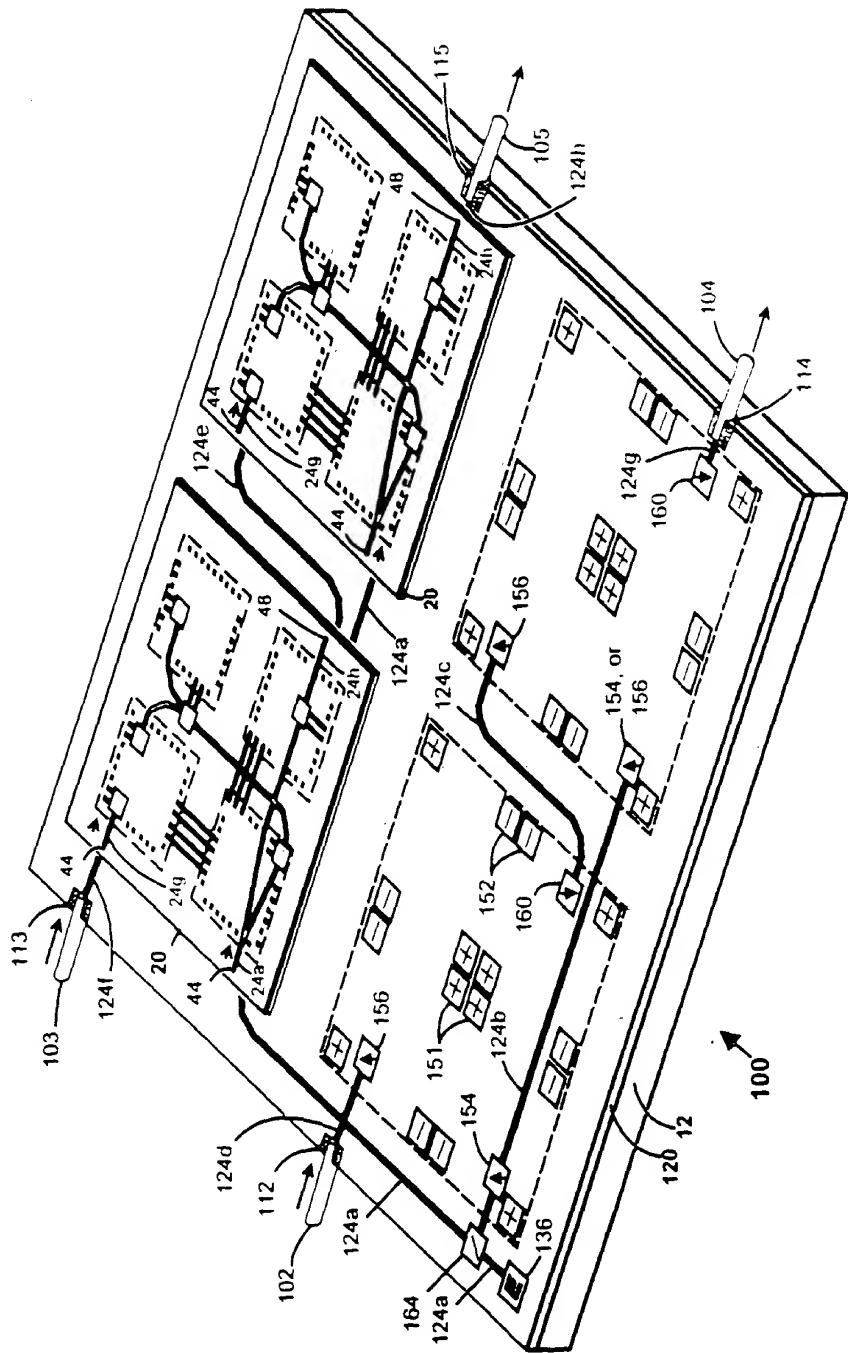
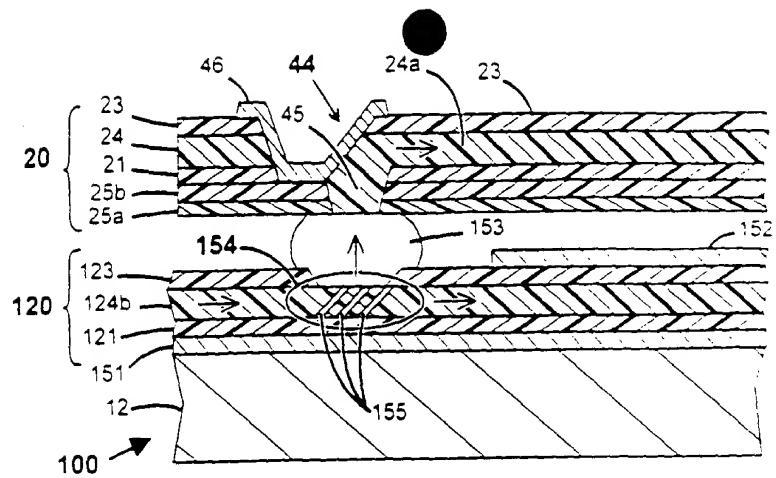
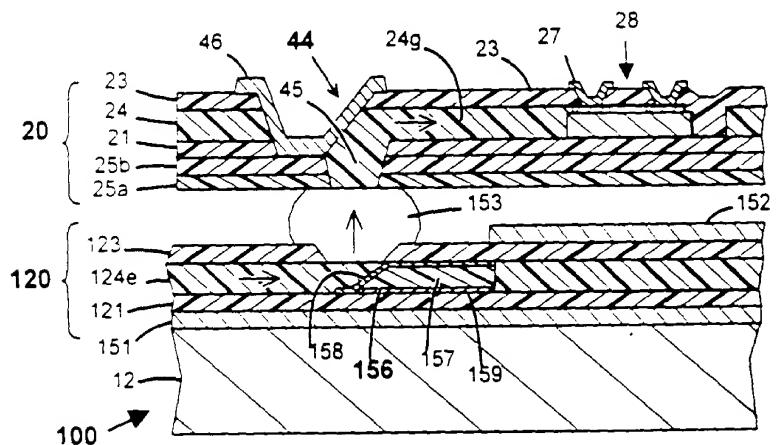


FIG. 21



**FIG. 22**

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**FIG. 23**

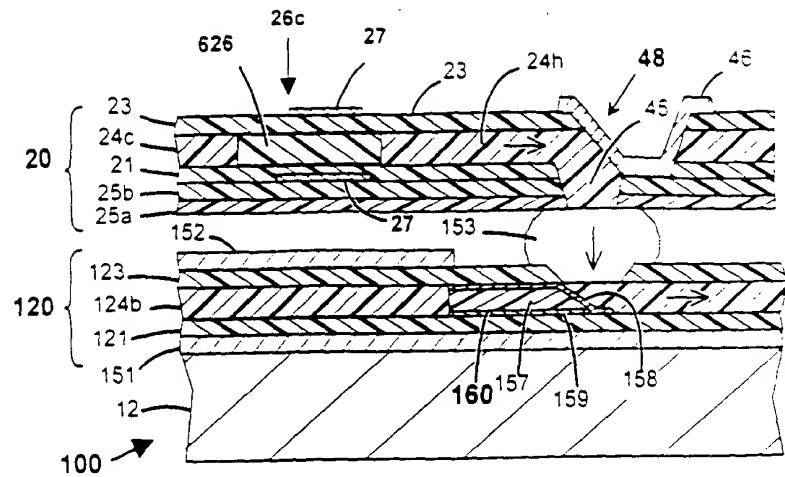
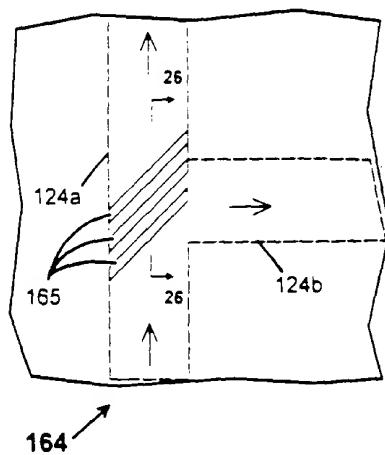
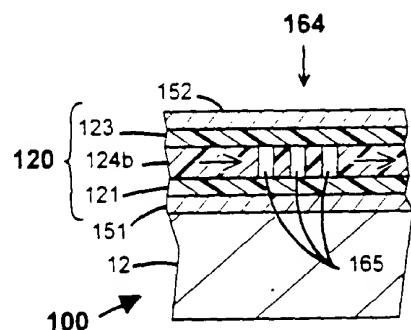


FIG. 24



**FIG. 25**



**FIG. 26**

FIG. 27

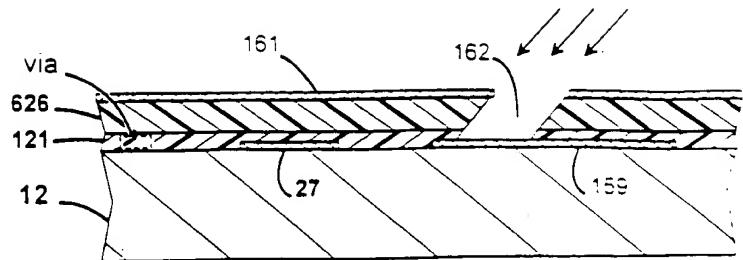


FIG. 28

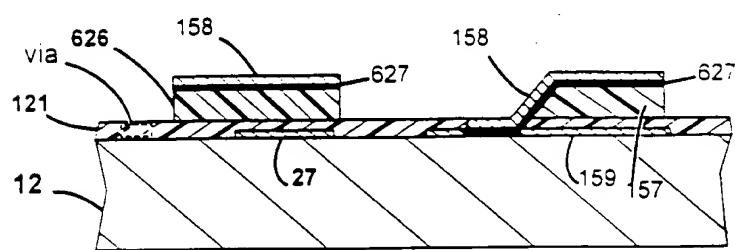


FIG. 29

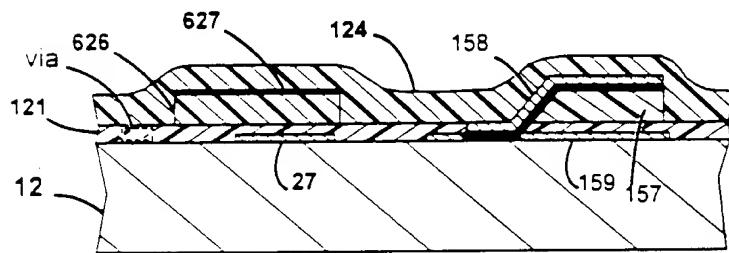
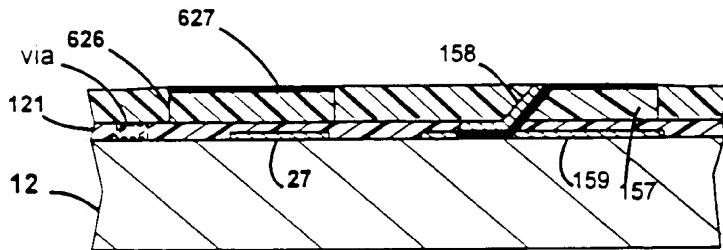
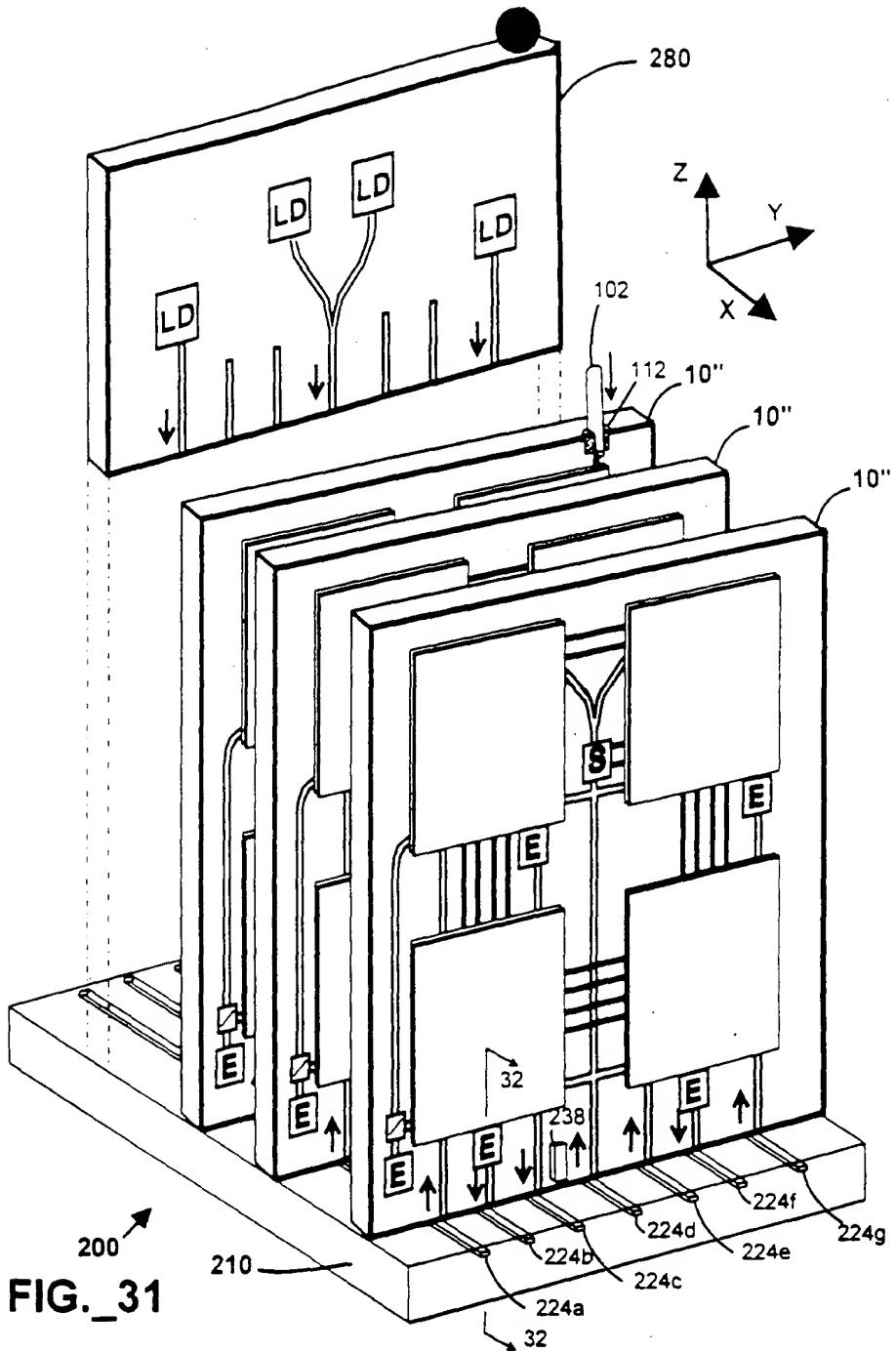


FIG. 30





**FIG. 31**

FIG. 32

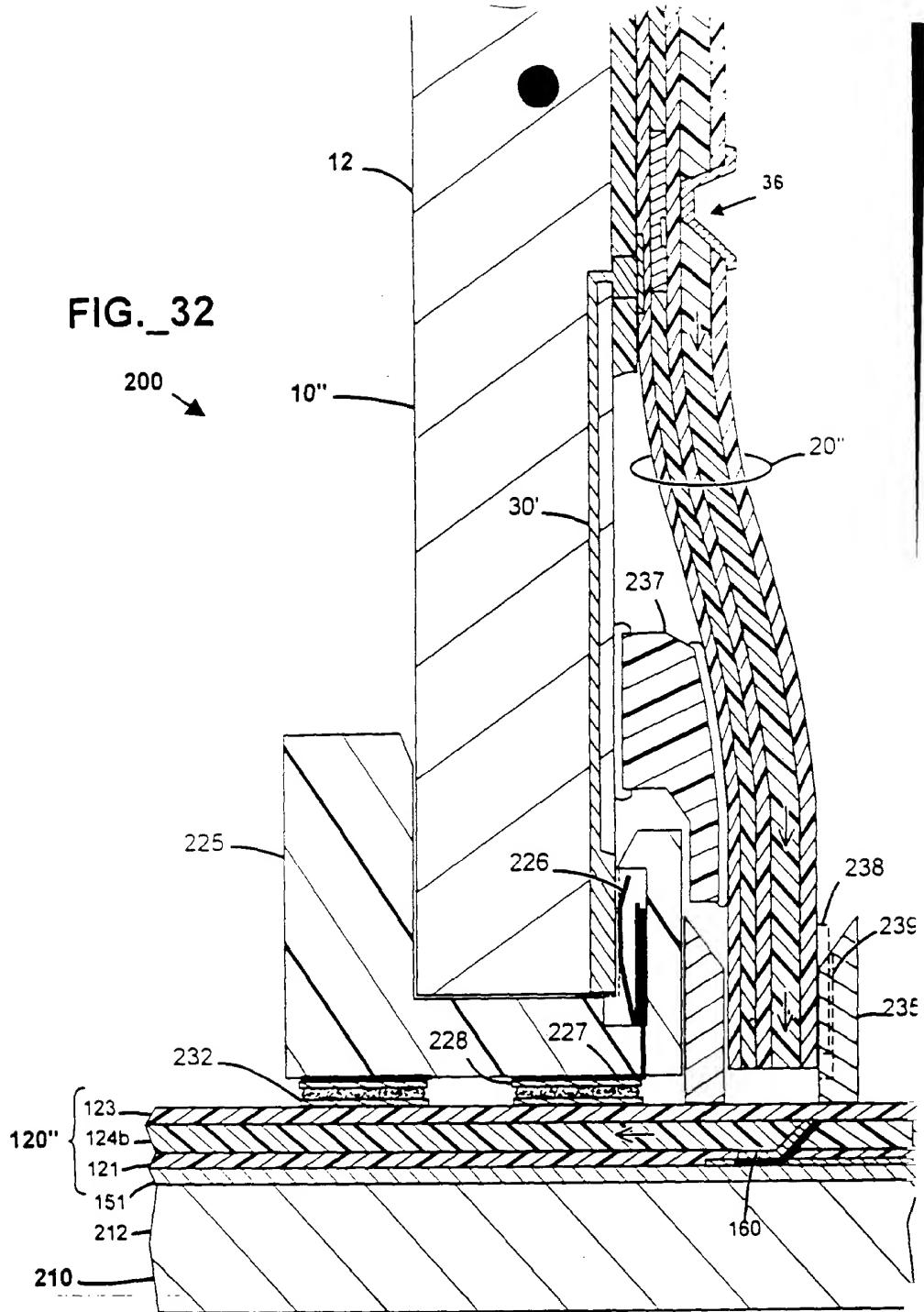
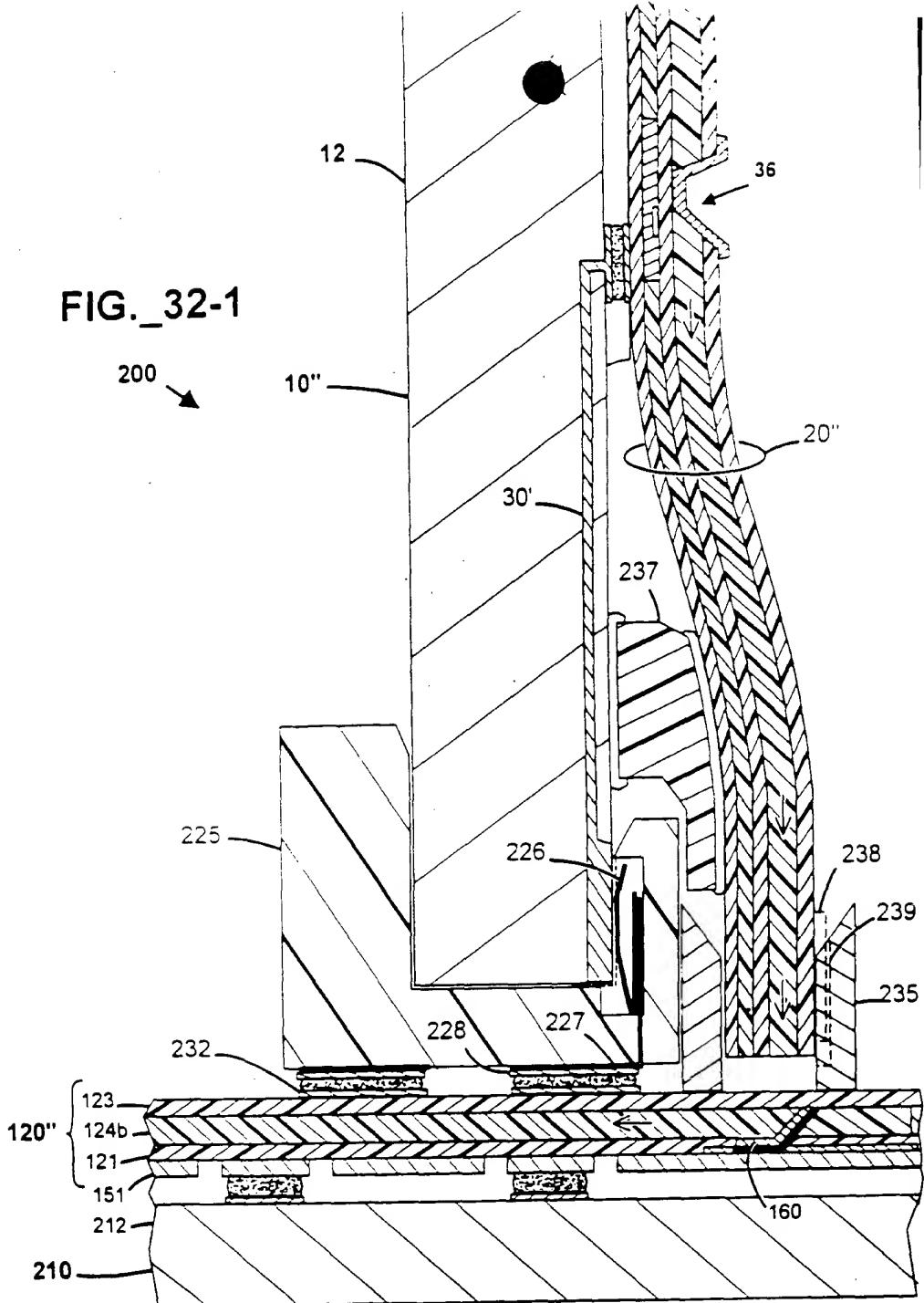


FIG. 32-1



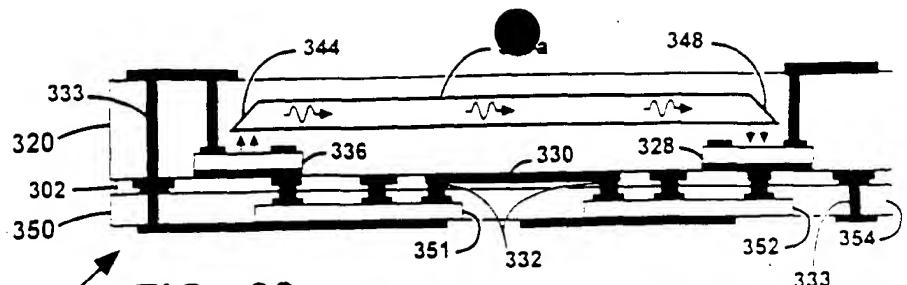


FIG. 33

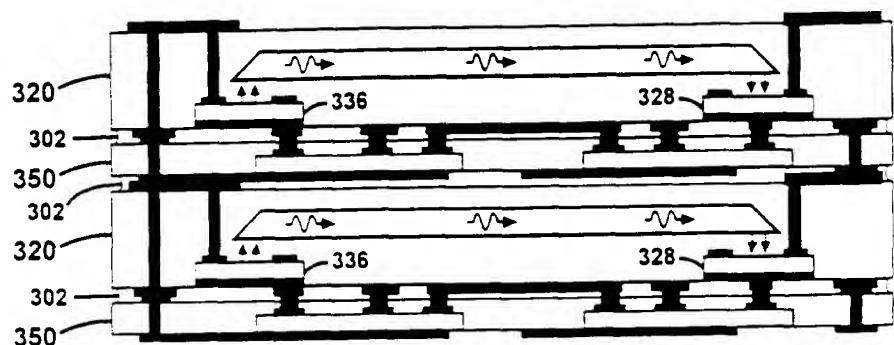


FIG. 34

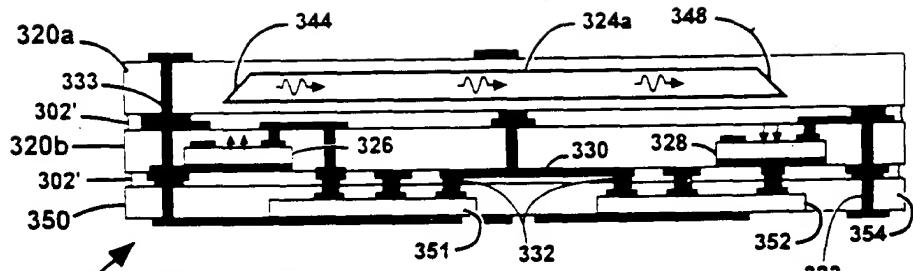
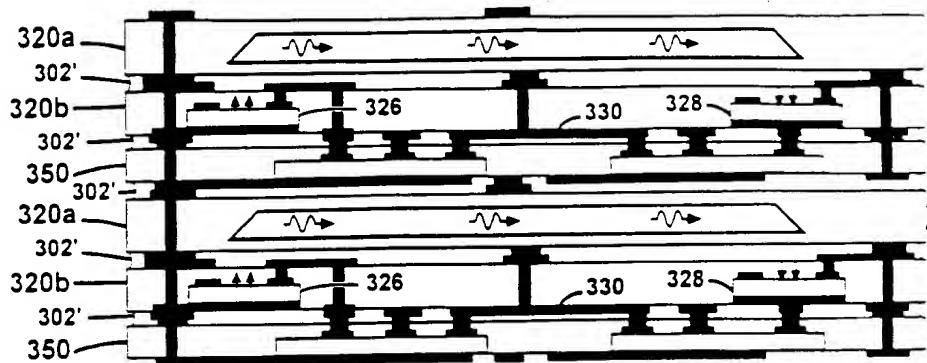
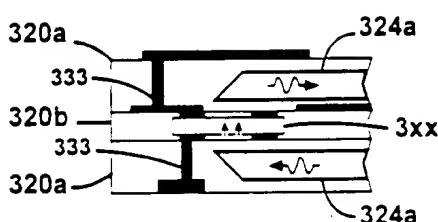


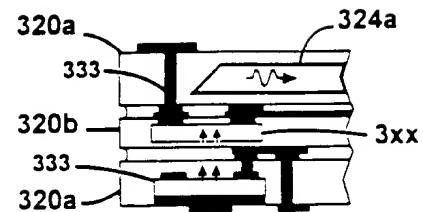
FIG. 35



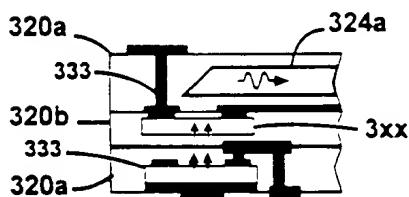
**FIG. 36**



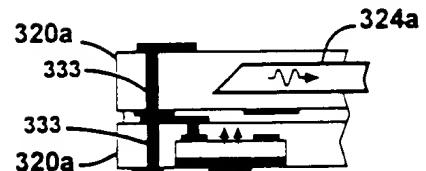
**FIG. 37-1**



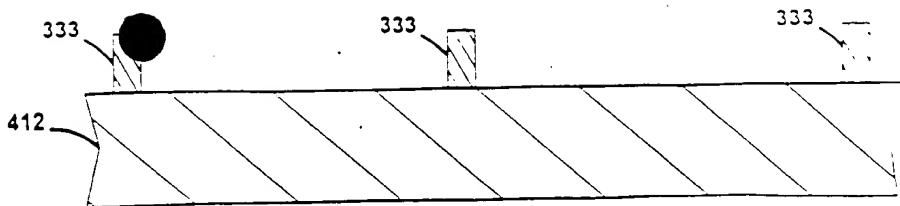
**FIG. 37-2**



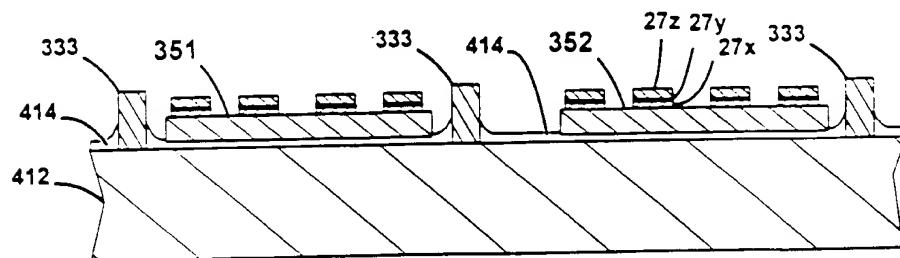
**FIG. 37-3**



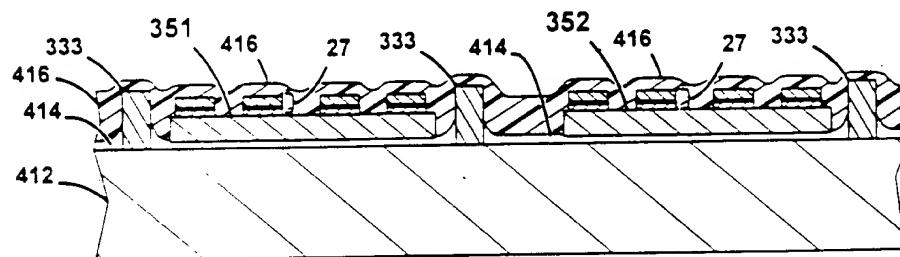
**FIG. 37-4**



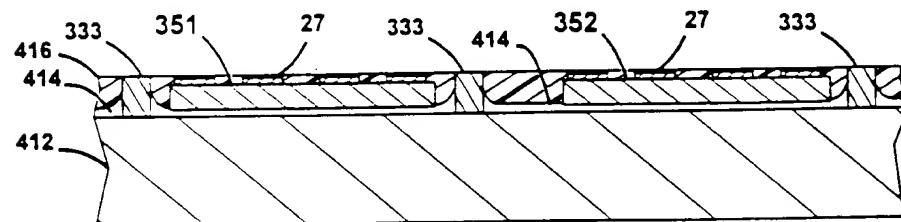
**FIG. 38**



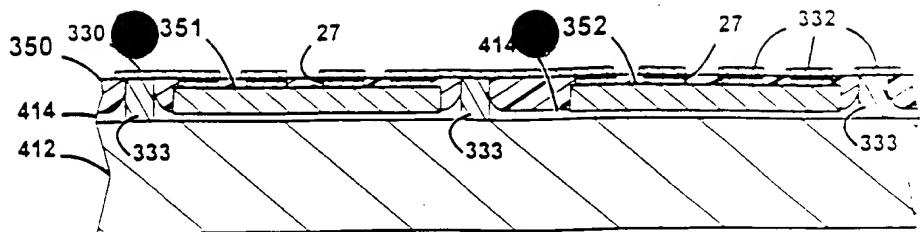
**FIG. 39**



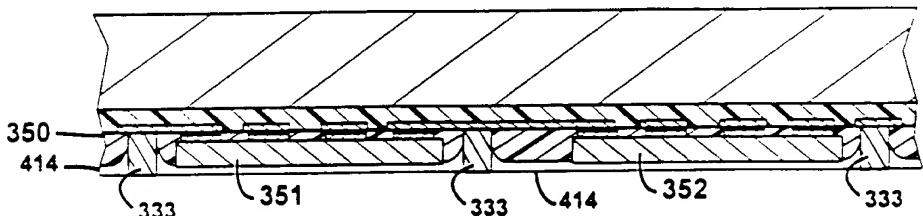
**FIG. 40**



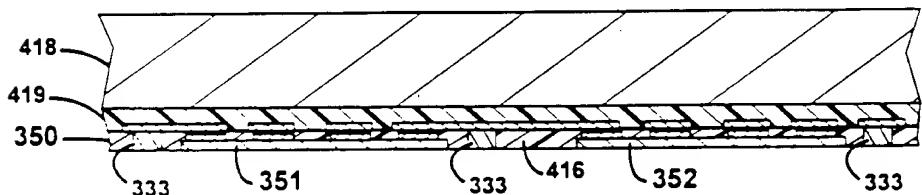
**FIG. 41**



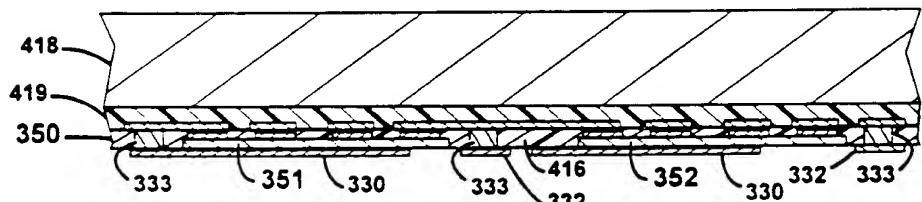
**FIG. 42**



**FIG. 43**



**FIG. 44**



**FIG. 45**

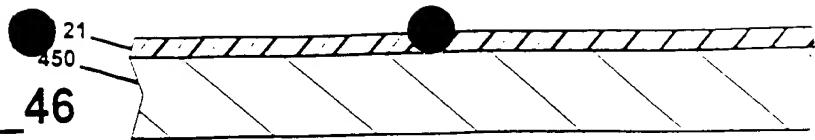


FIG. 46

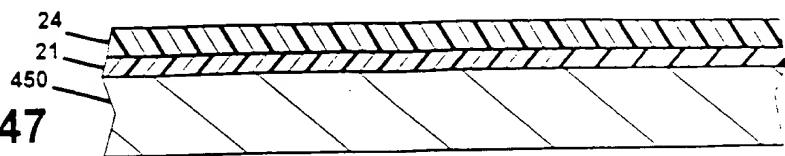


FIG. 47

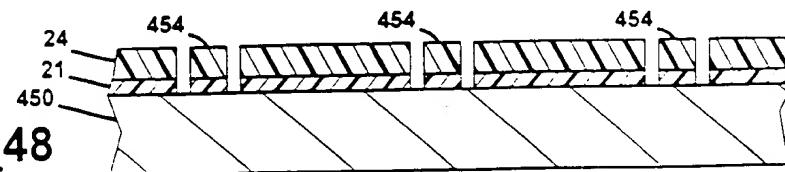


FIG. 48

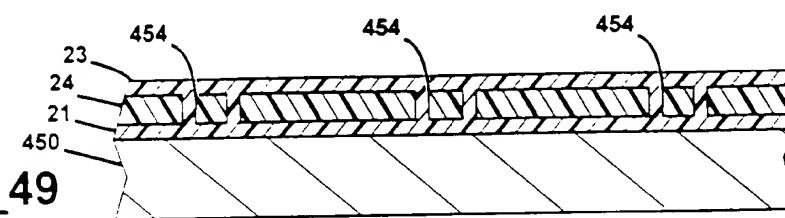


FIG. 49

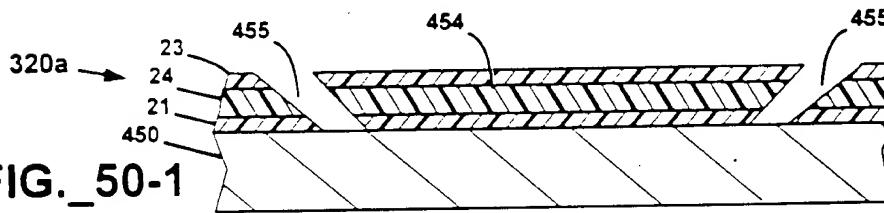


FIG. 50-1

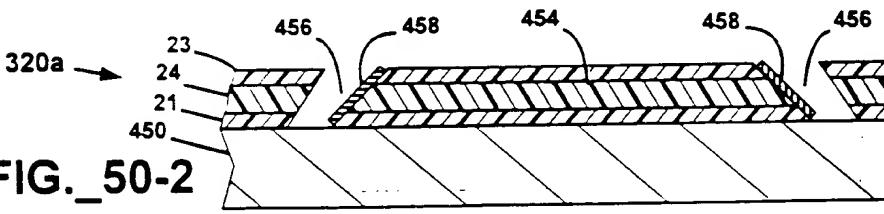
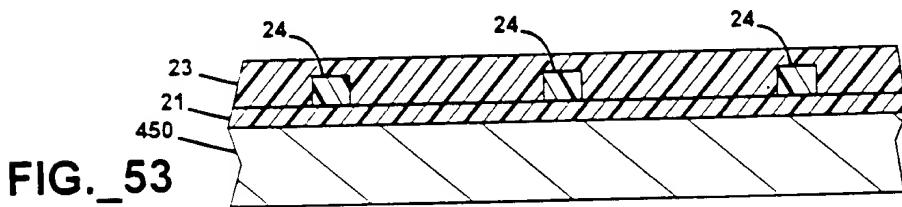
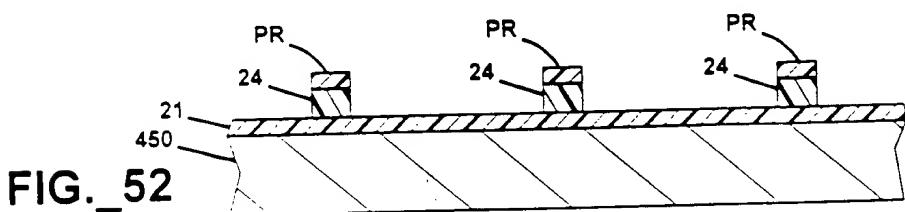
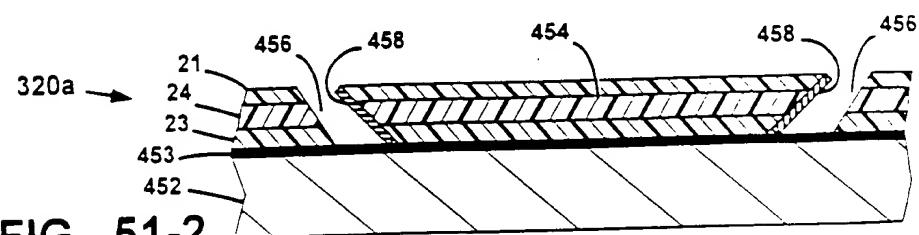
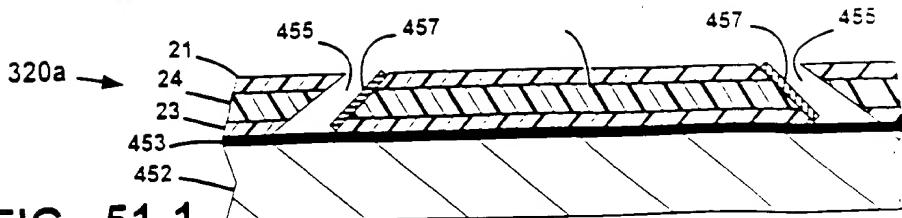


FIG. 50-2



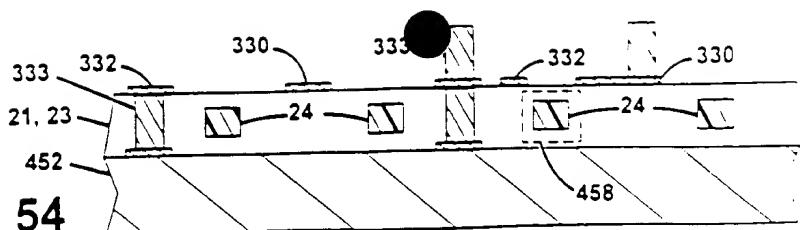


FIG. 54

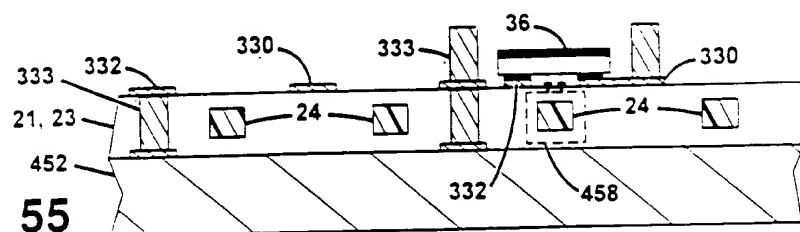


FIG. 55

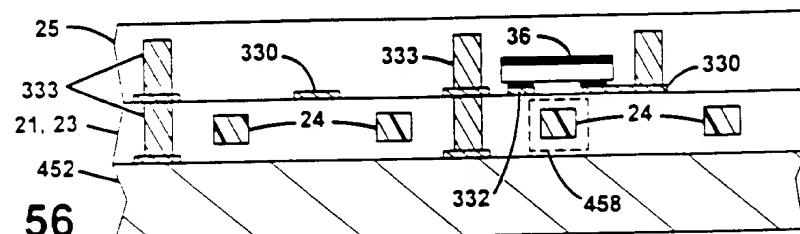


FIG. 56

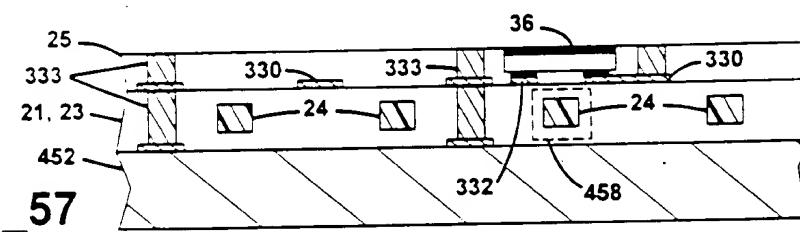


FIG. 57

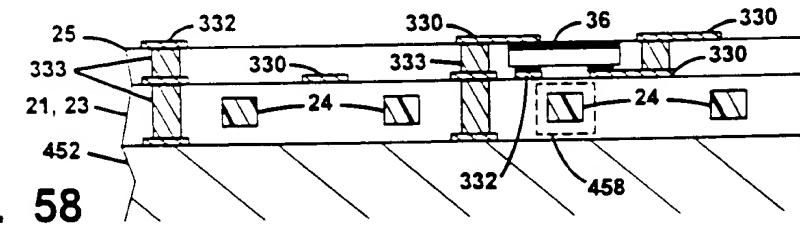
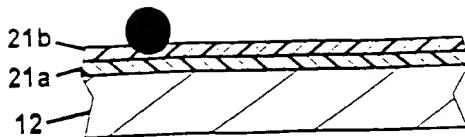
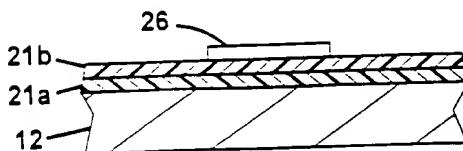


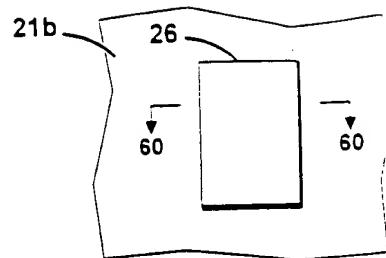
FIG. 58



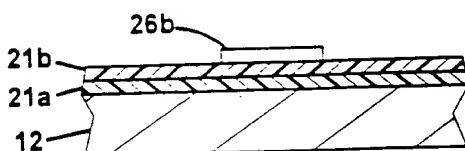
**FIG. \_59**



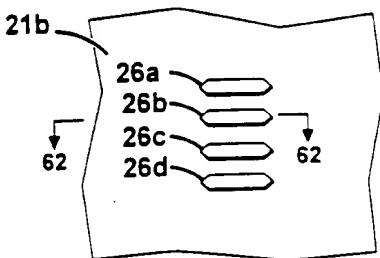
**FIG. \_60**



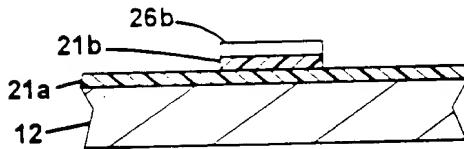
**FIG. \_61**



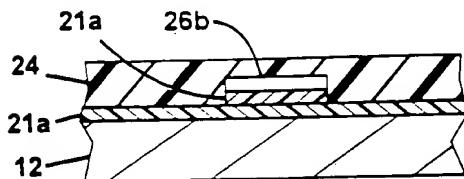
**FIG. \_62**



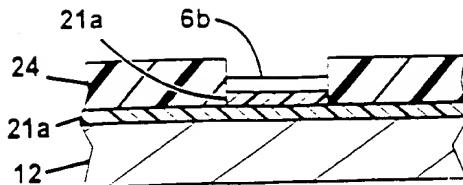
**FIG. \_63**



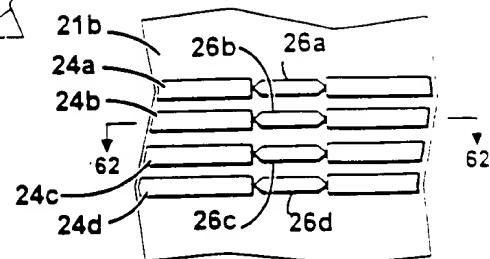
**FIG. \_64**



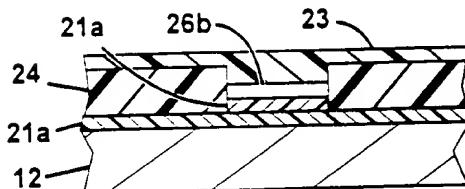
**FIG. \_65**



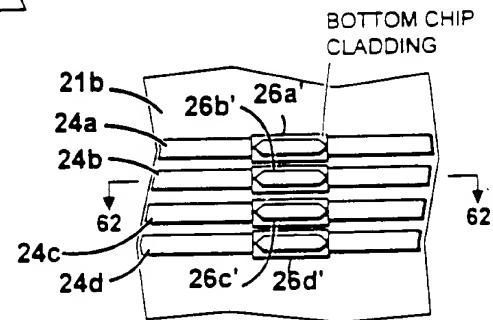
**FIG. 66**



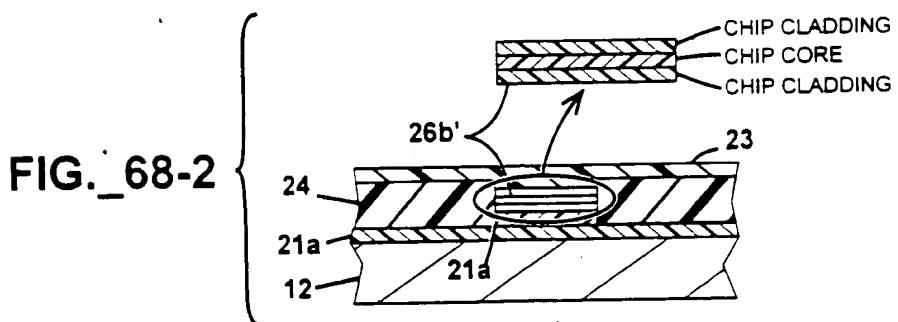
**FIG. 67**



**FIG. 68**



**FIG. 67-2**



**FIG. 68-2**

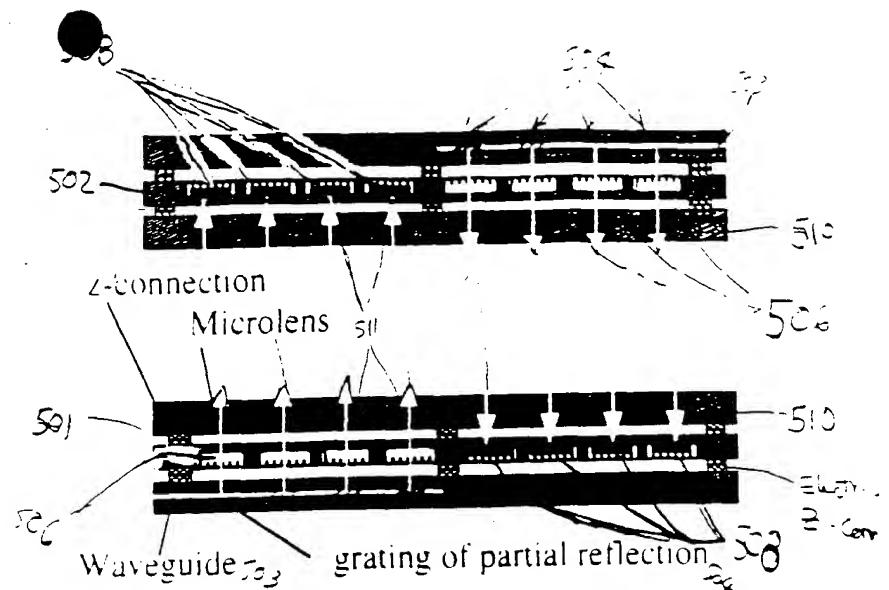


Fig. 3

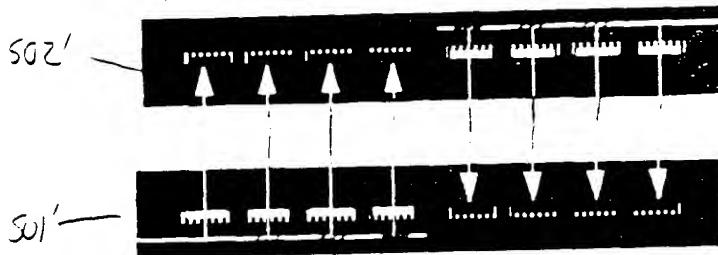


Fig. 70

Vertical  
optical  
interconnects  
/ Z-connections

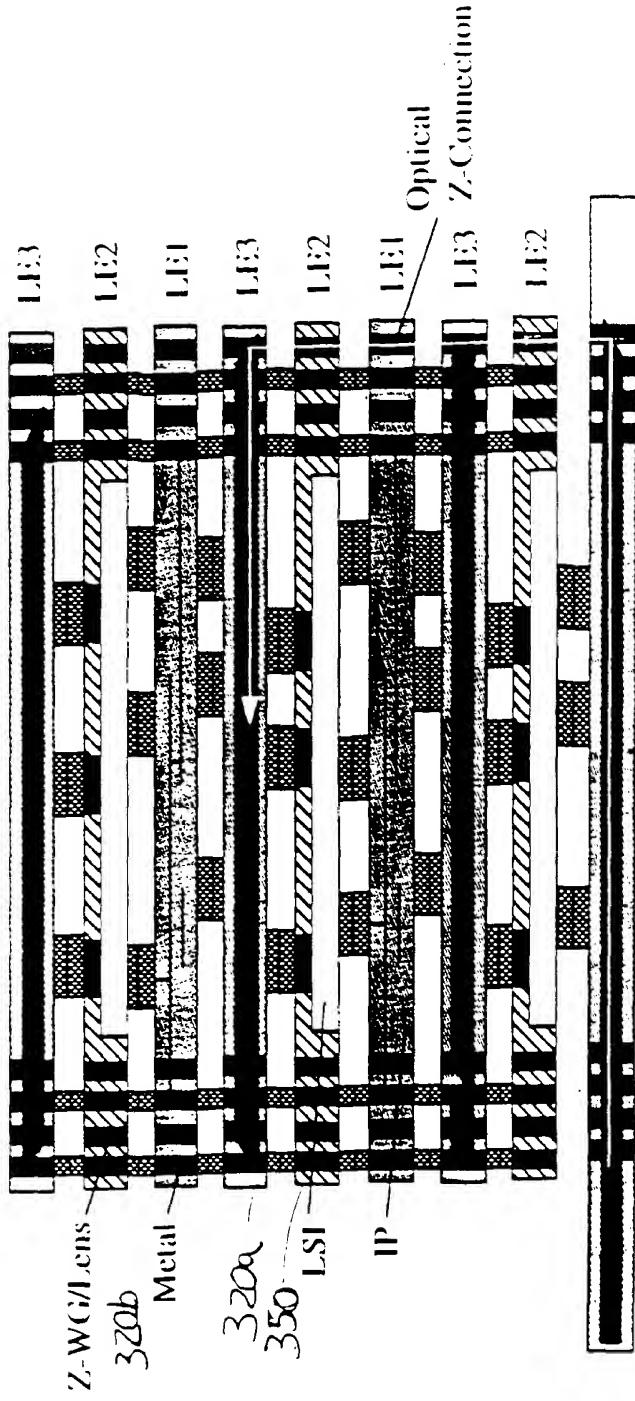
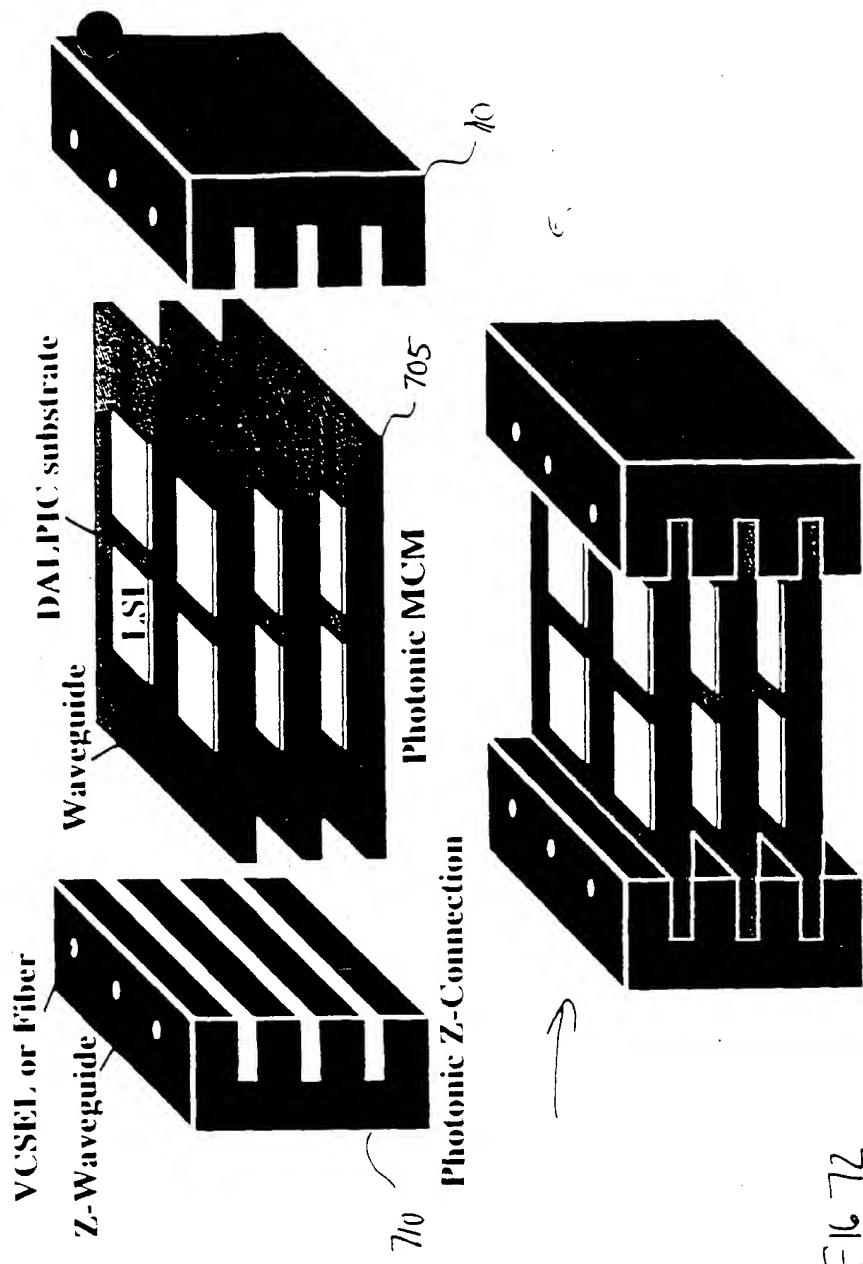


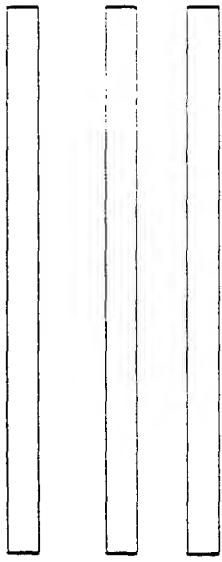
Fig. 7

Optical Backplane



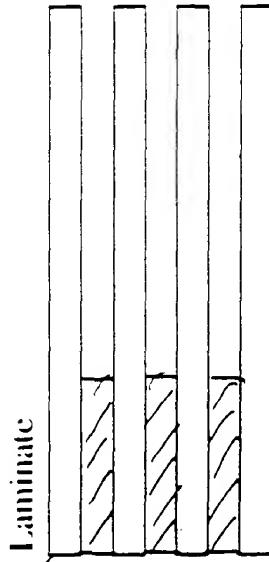
Flexible Photo-imangible sheet (Polyguide)

Bonding sheet attach



Laminate

SOI-NFT process



Post cure

Assemble

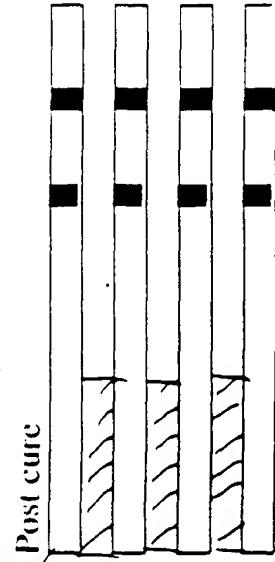
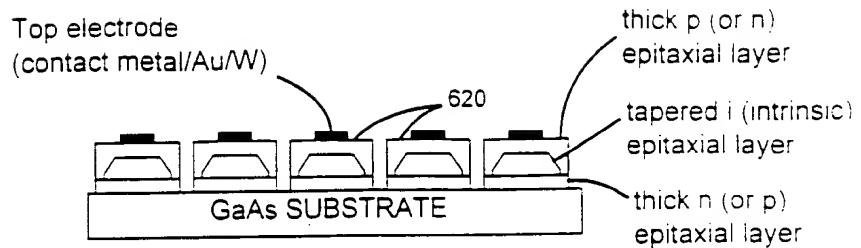
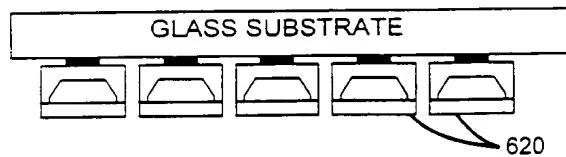


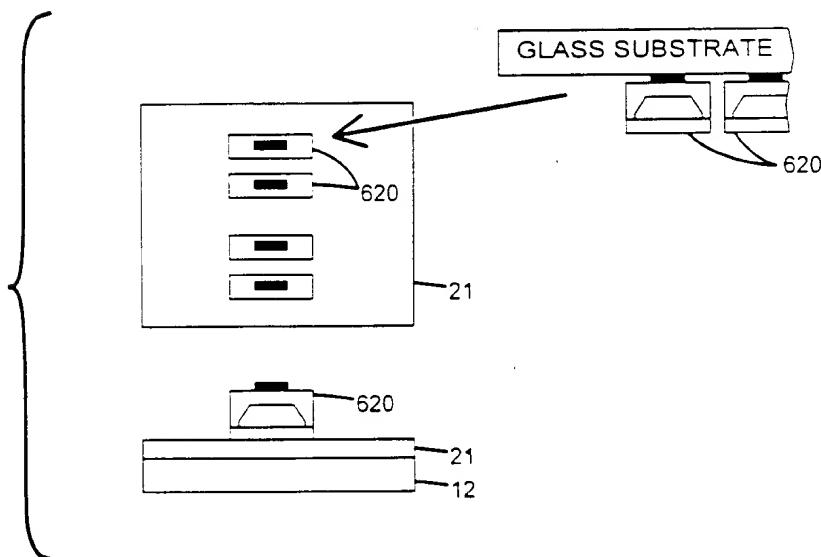
FIG. 73



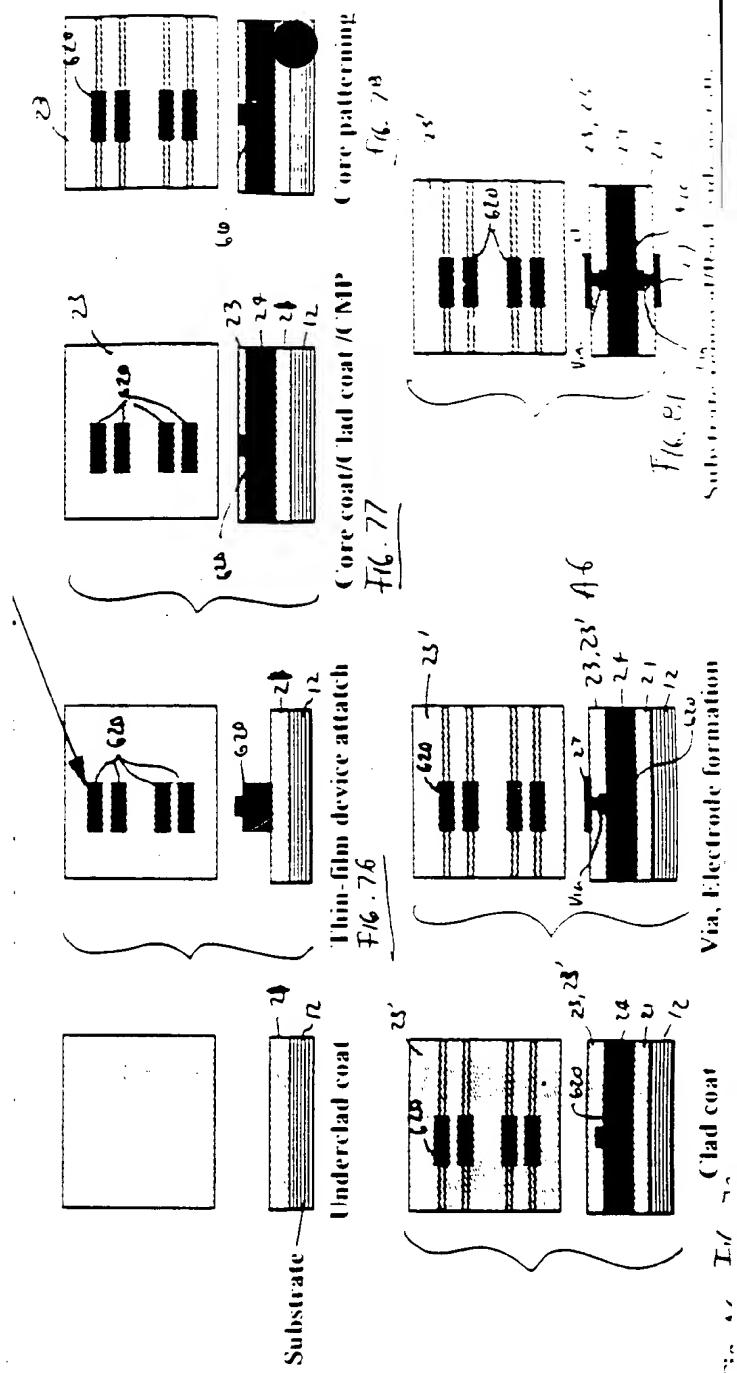
**FIG.\_74** (Epitaxial growth and patterning)



**FIG.\_75** (Epitaxial liftoff)



**FIG.\_76** (Transfer)



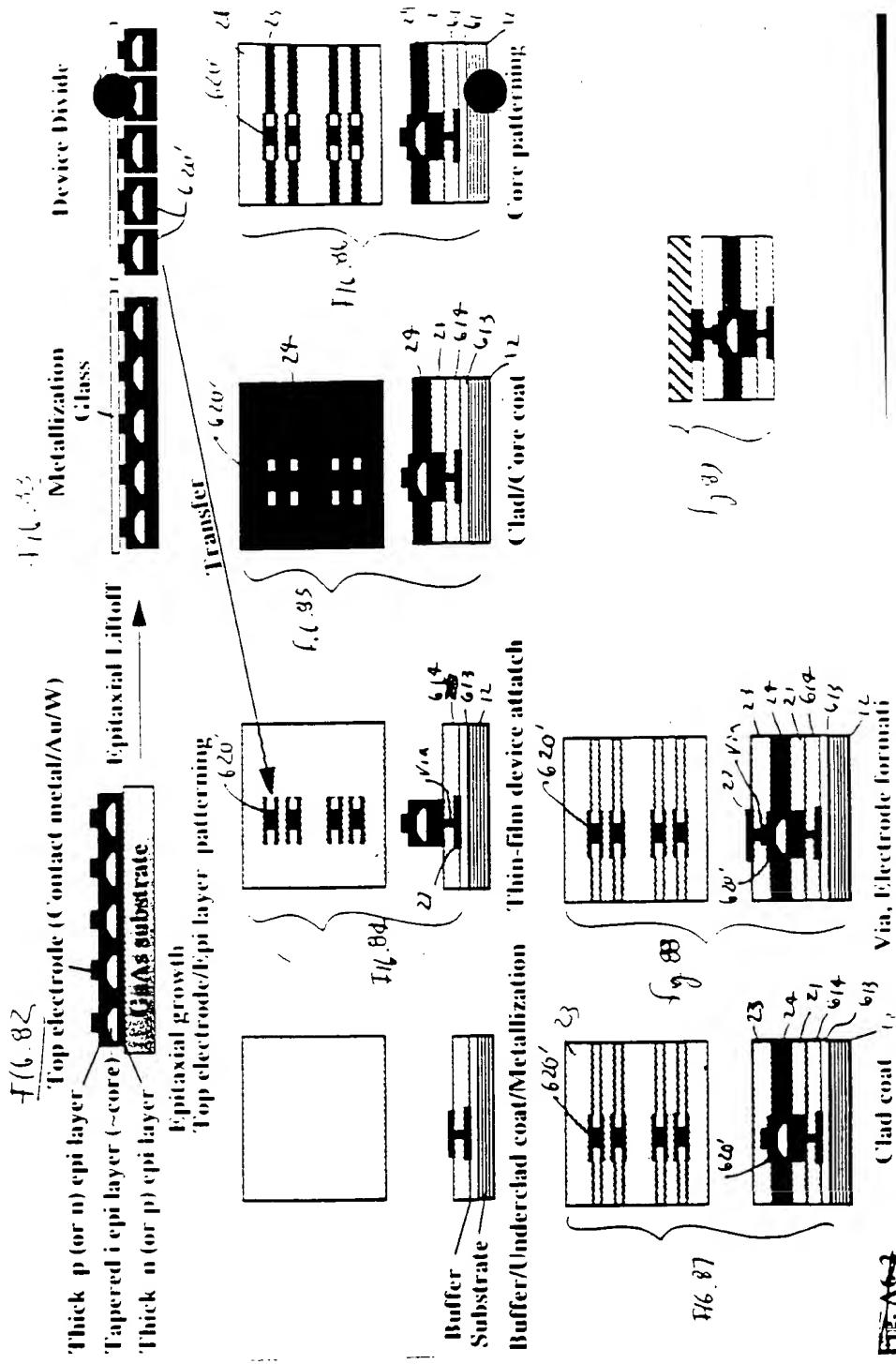
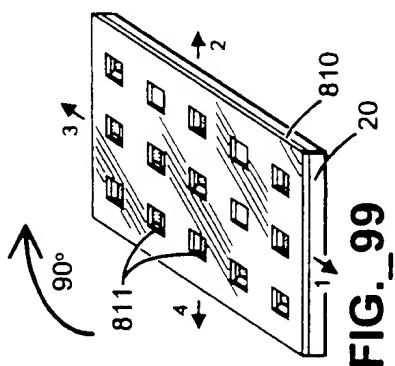
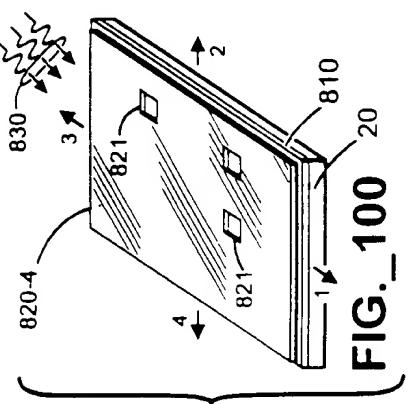
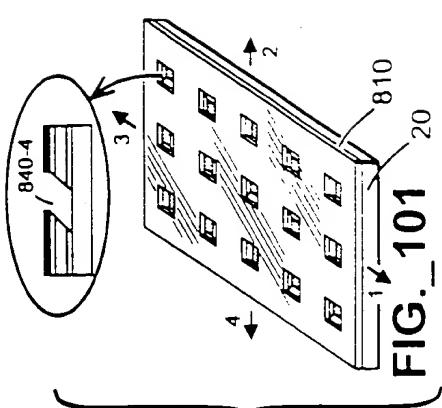
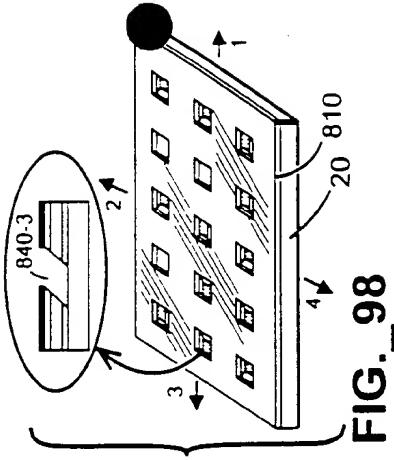
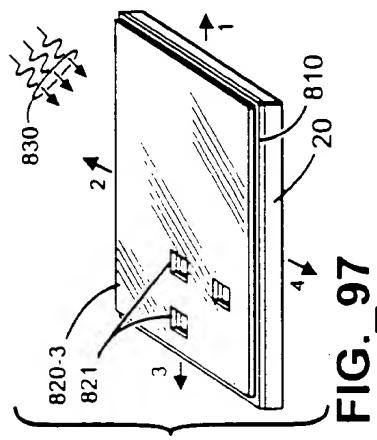
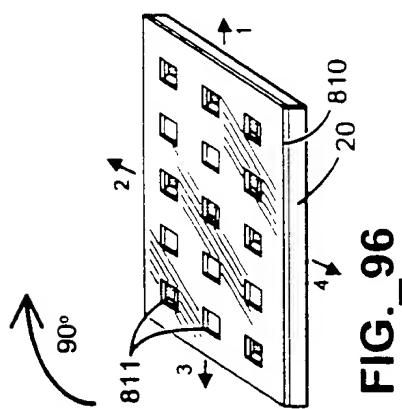


FIG. 201 202 203 204 205 206 207



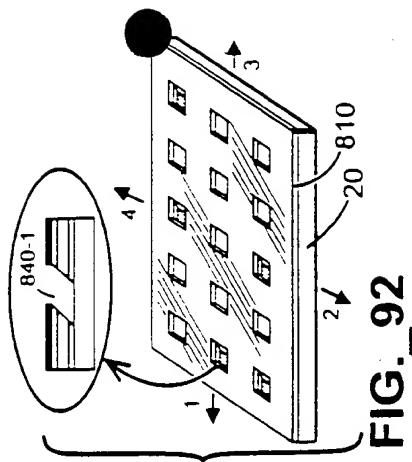


FIG. 92

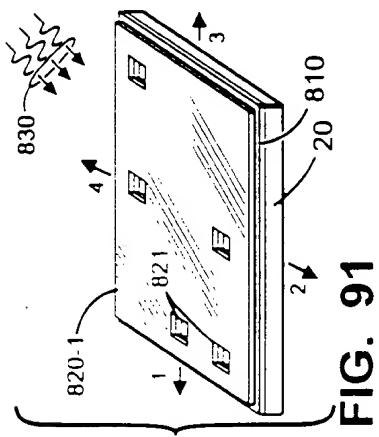


FIG. 91

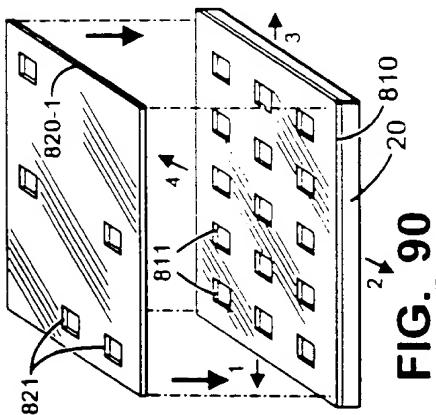


FIG. 90

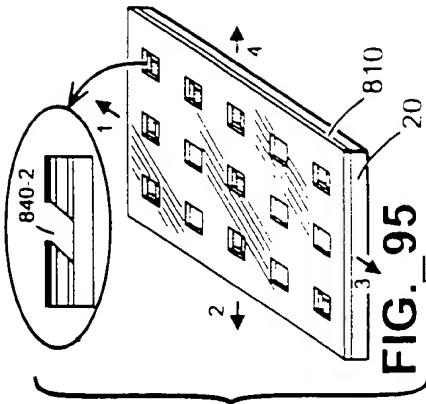


FIG. 95

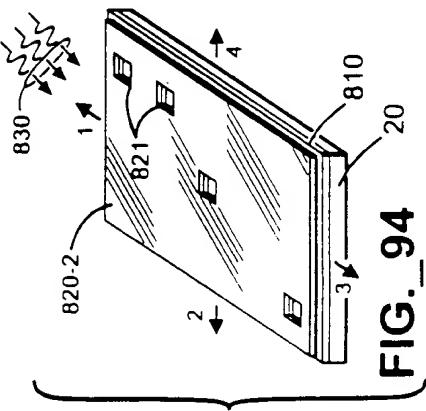


FIG. 94

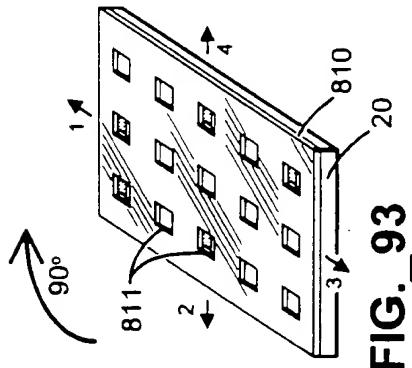
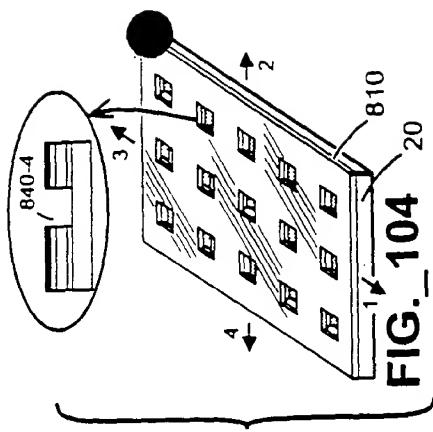
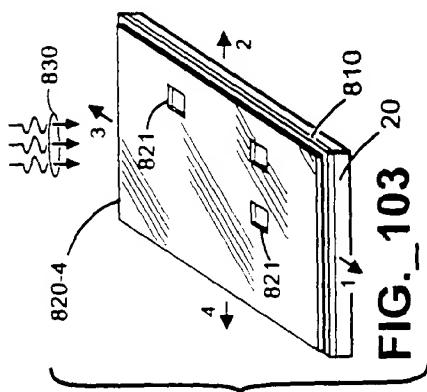


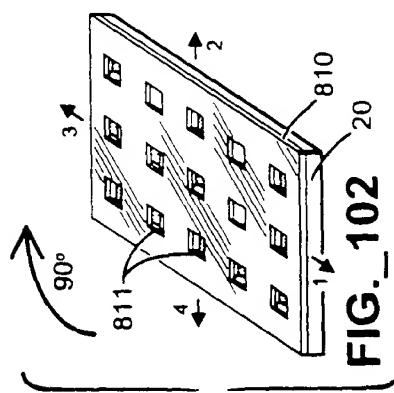
FIG. 93



**FIG. 104**



**FIG. 103**



**FIG. 102**

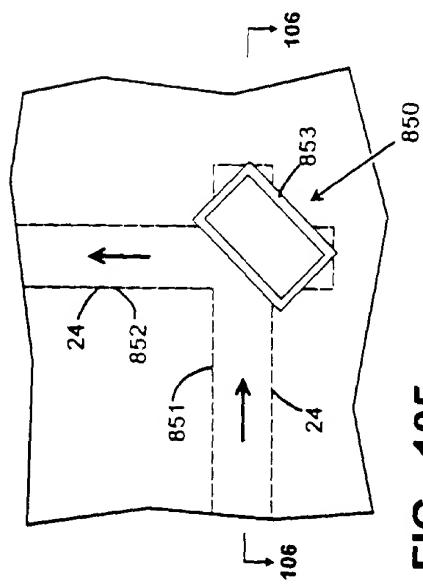


FIG. 105

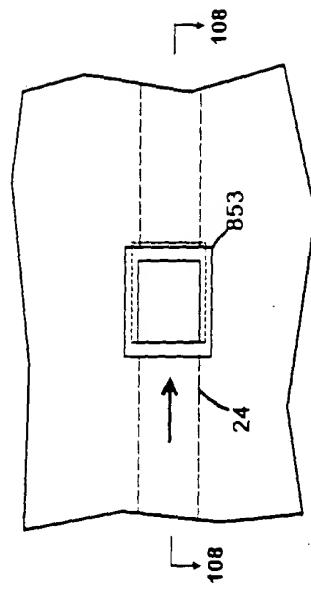


FIG. 107

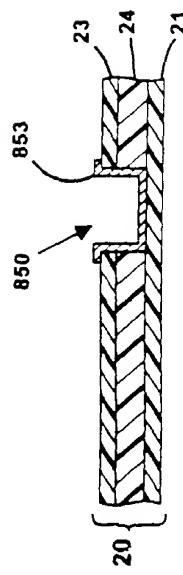


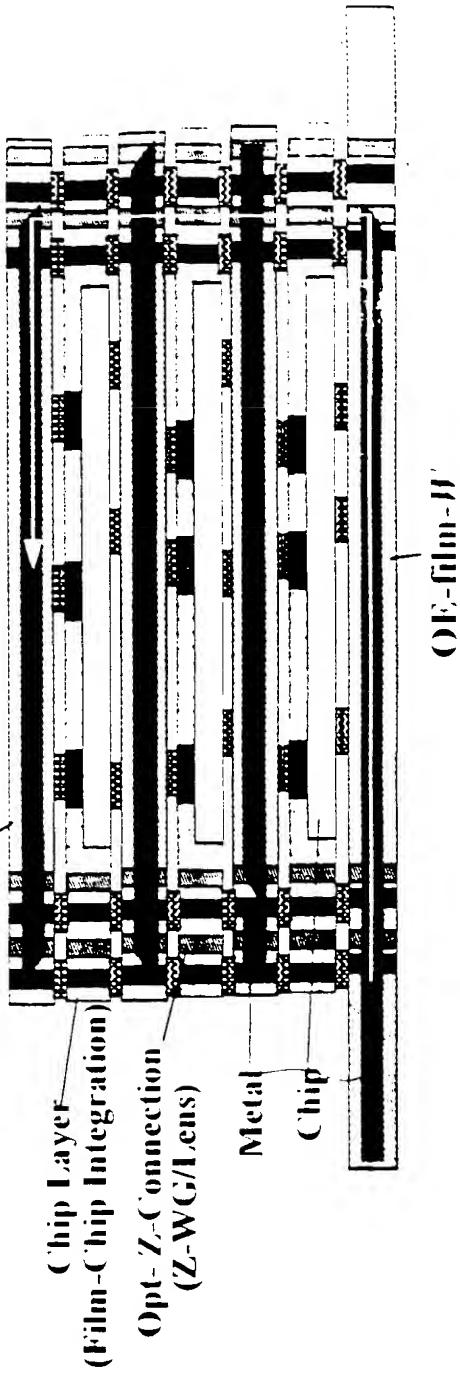
FIG. 106



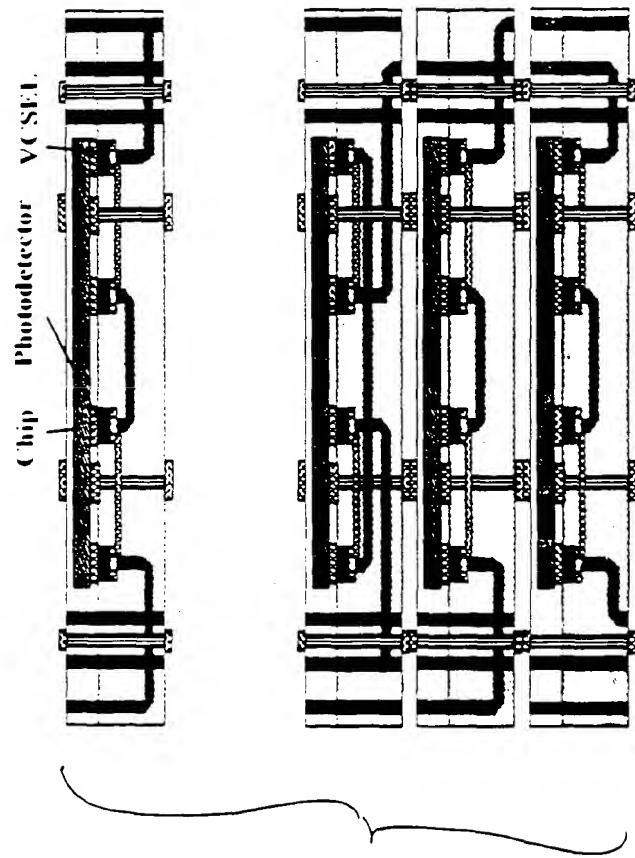
FIG. 108

**FUJITSU Computer Packaging Technologies, Inc.**  
**GS CX/CXX OE Solution --- OE-3D-Stack**

**OE-film-DW (1) or (M)**



2002-07-01 2002-07-01

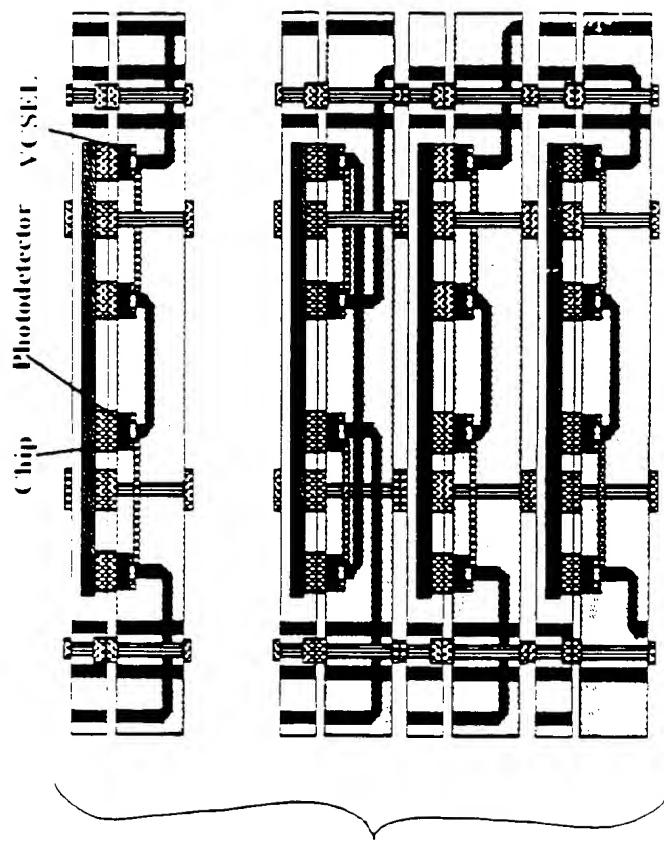


F16.110

(2/23/99) AAI Detail picture Example for 3D stack

(New version of the AAI of 2/5/99)

TD2270 "28529260

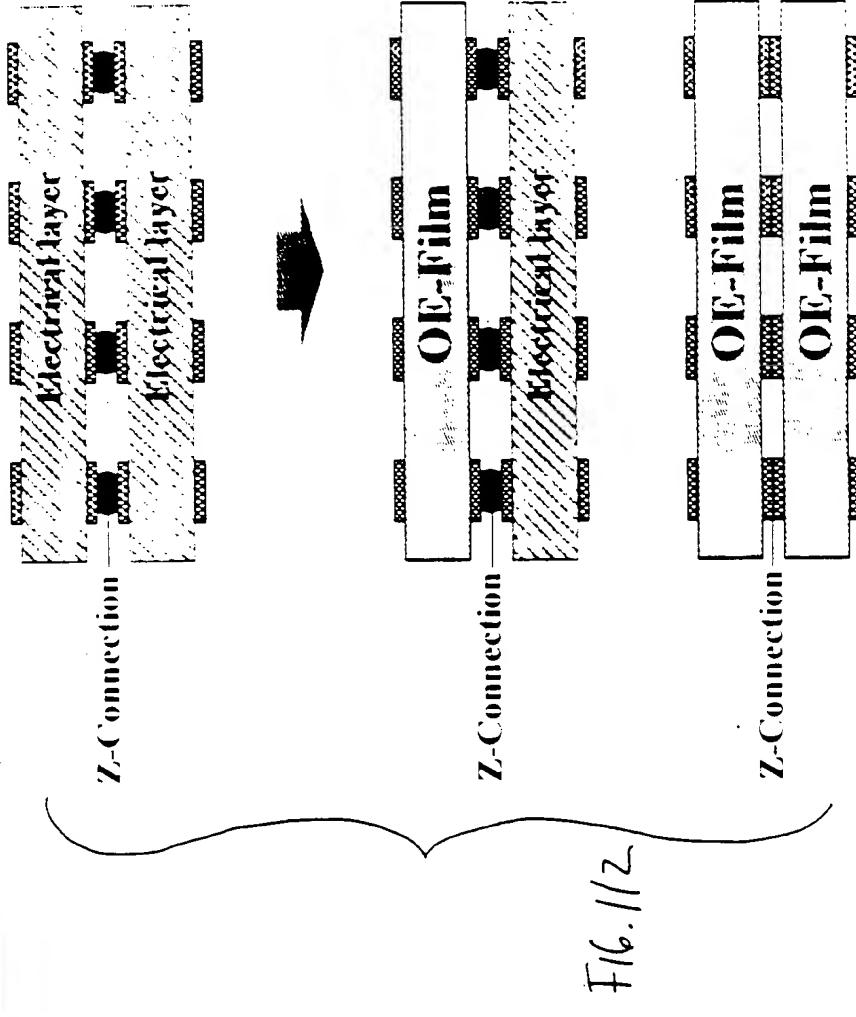


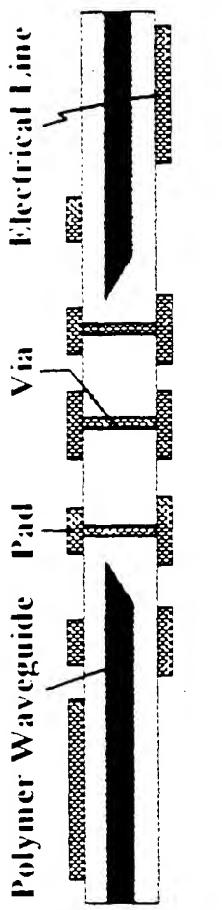
F16.114

(2/23/99) AA2 Detail picture Example for 3D stack  
(New version of the AA2 of 2/5/99)

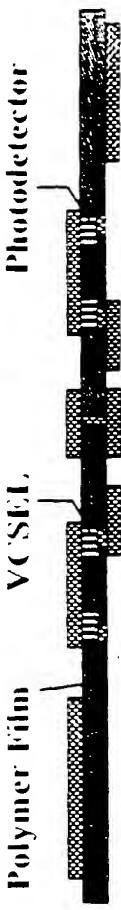
A24

## Film/Z-Connection Application to OE-Substrate

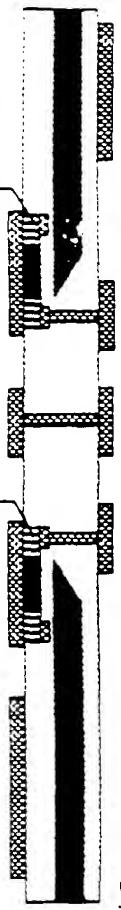




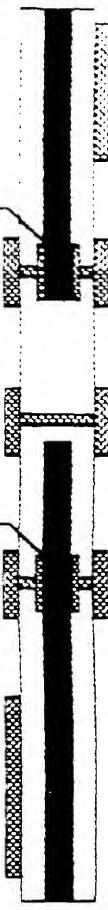
DE-RELLMS



OF-E-6111-D



F16.114



OE-film-DIV(M)

2/17/99-added 2

## Fiber Array OE-Film-DW (I)

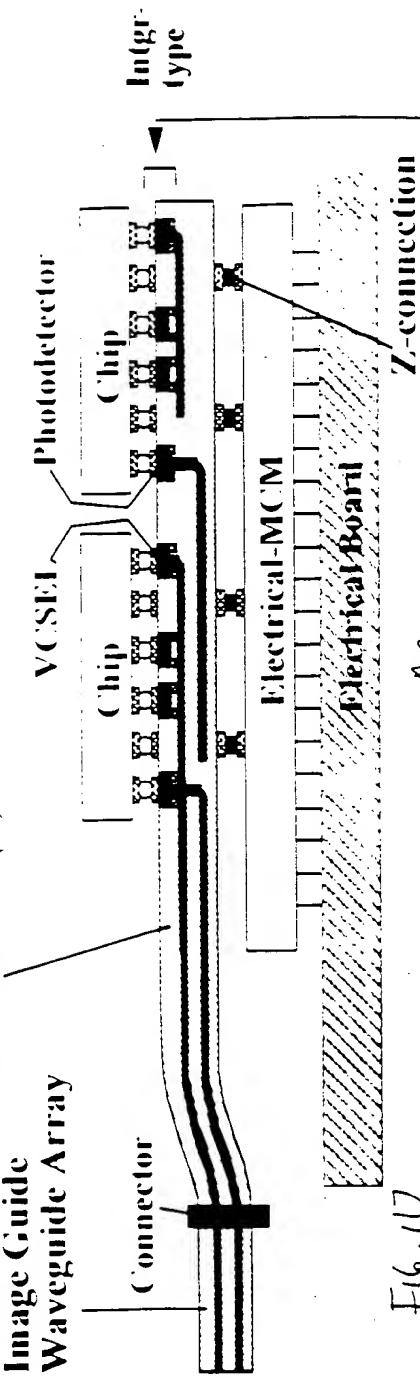
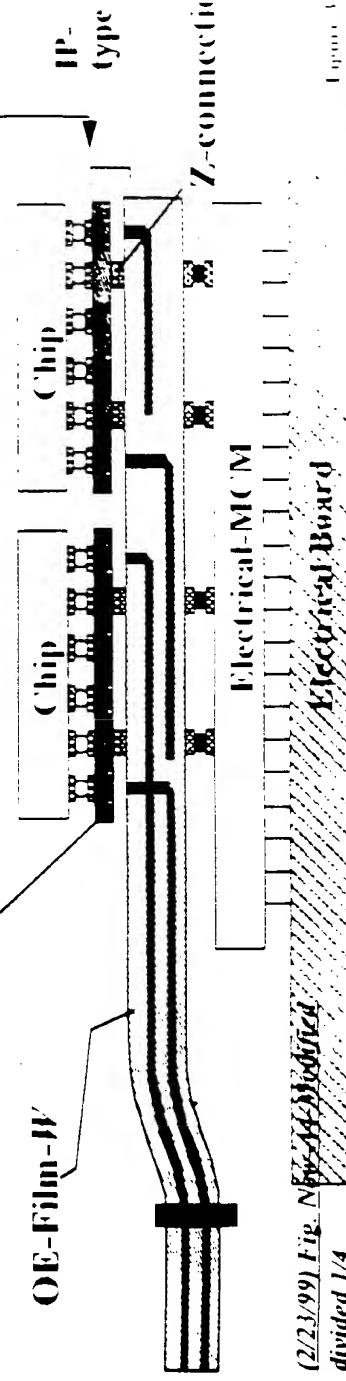


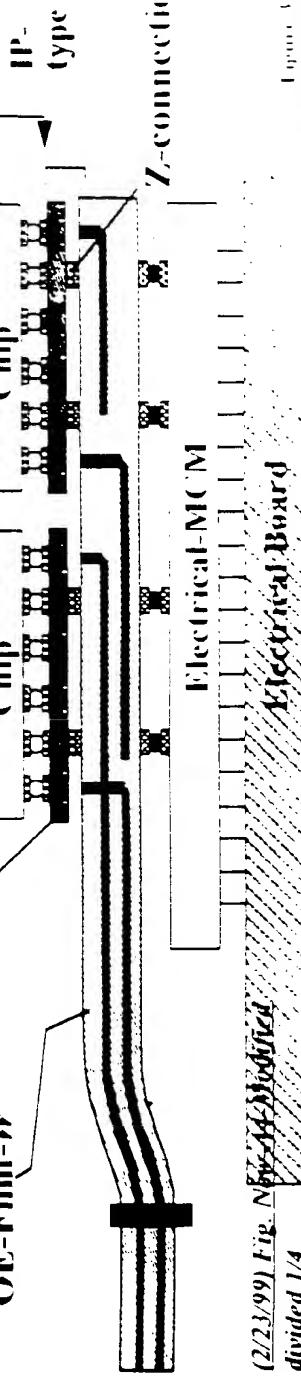
Fig. 6.117

## OE-Film-D



Z-connection

## OE-Film-W



A 9

(2/23/99) Fig. No. 6.114 Modified  
divided 1/4

Fig. 6.118 a 1/27/99

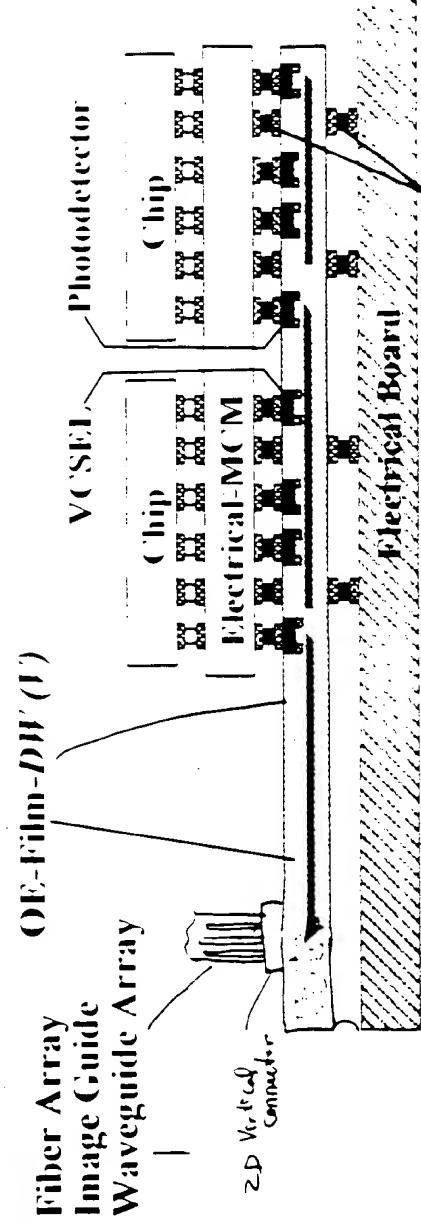
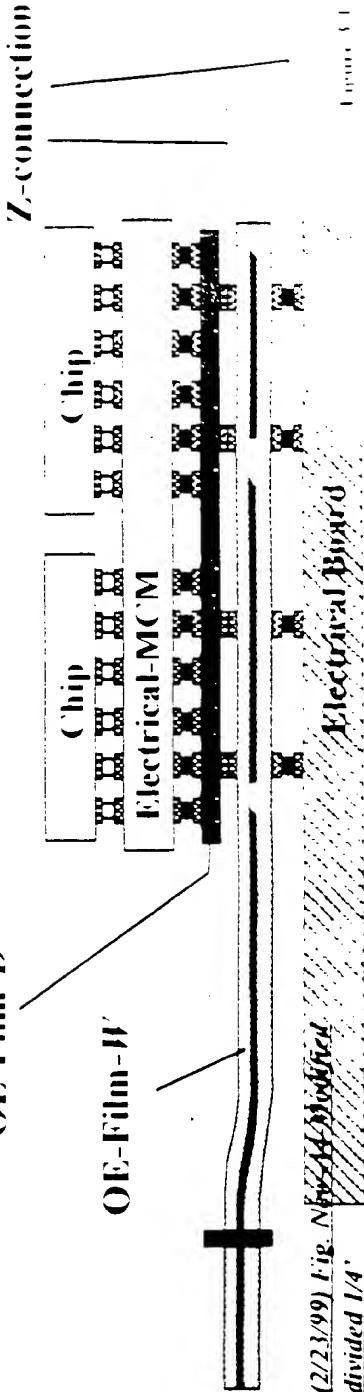


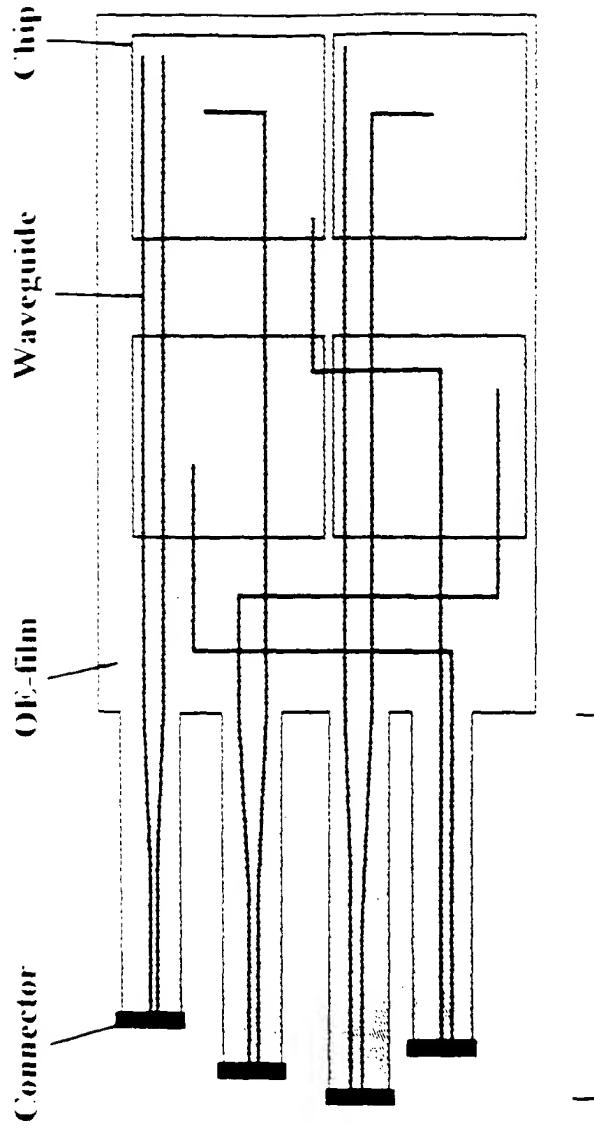
Fig. 119

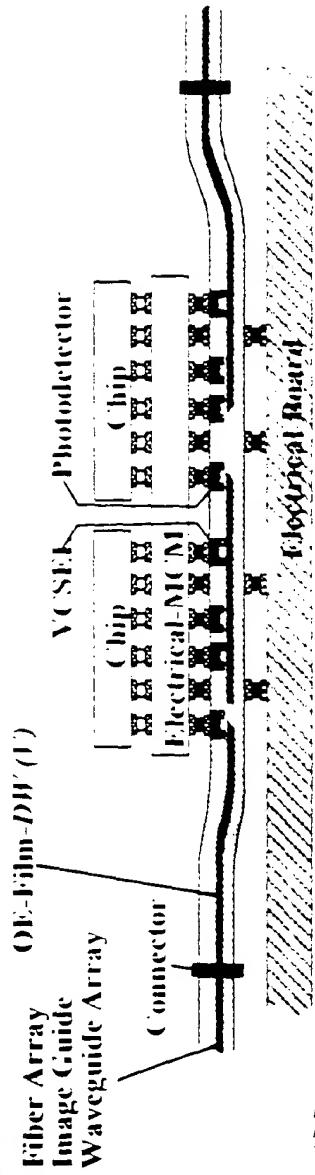
OE-Film-D

A10

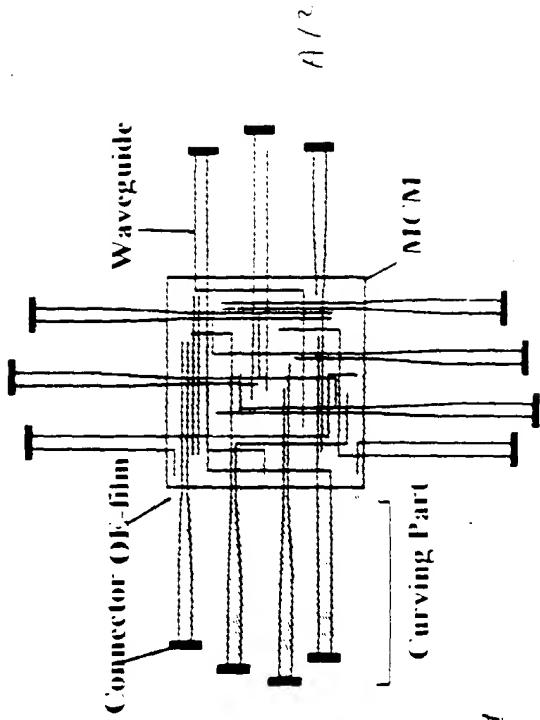
(2/23/99) Fig. No. 14 Modified  
divided 1/4

**FUJITSU Computer Packaging Technologies, Inc.** **FCPT**  
**FOLM with Optical Path Length Controller, Connector Buffer**





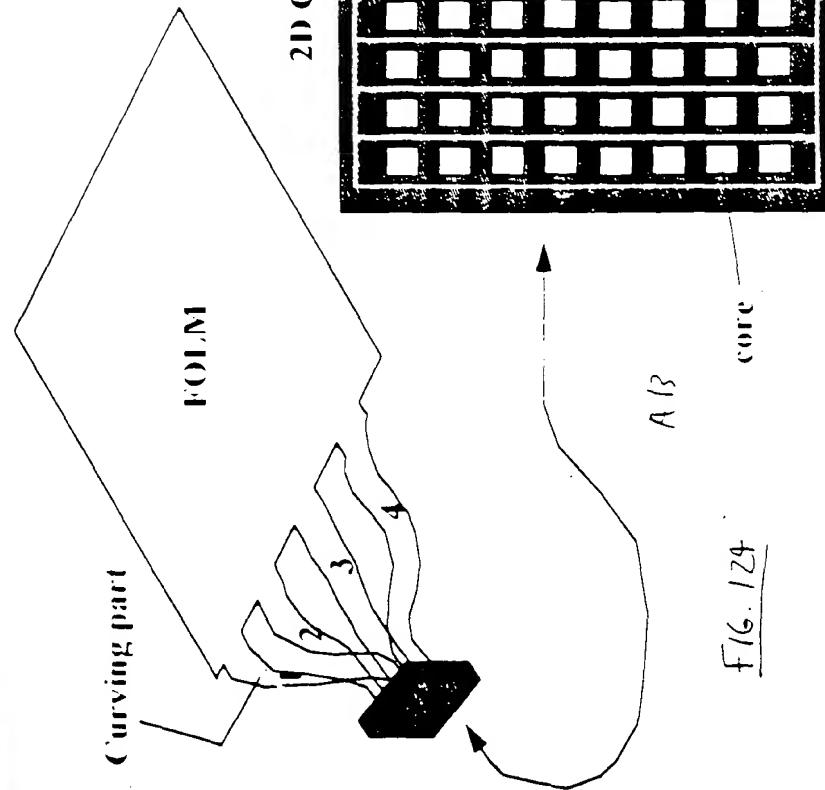
f16.123



f16.122

*(2/23/99) Fig. New At Modified  
divided 24.*

## FOLM with 2D Waveguide Connector



(223/99) Fig. New At Modified  
divided 1/4

(for Single-layer waveguide) (for 2 layer waveguide) (new)

## FOLM: High-Speed Option

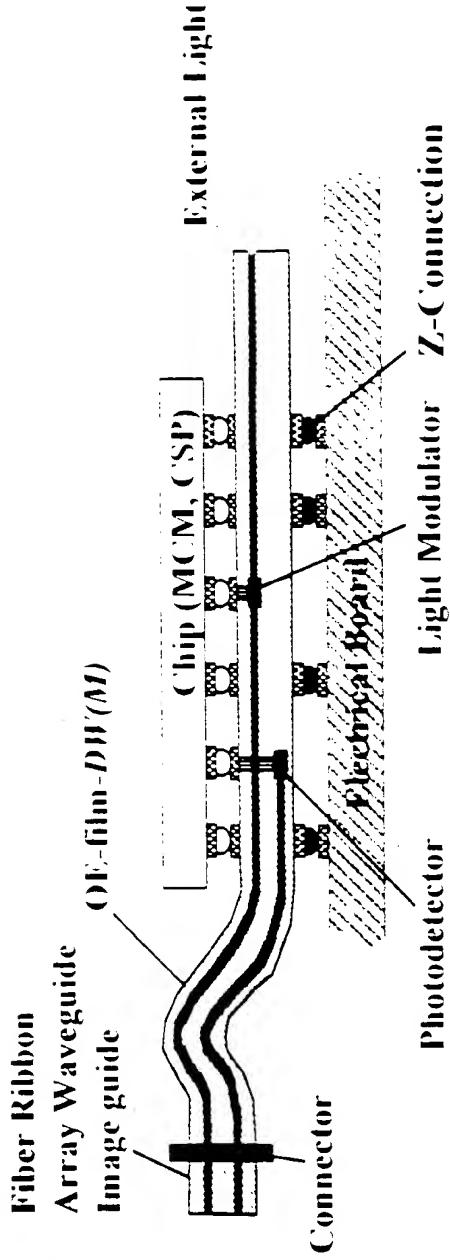


Fig. 125

114



## FCPT Structure Example (VCSEL, part)

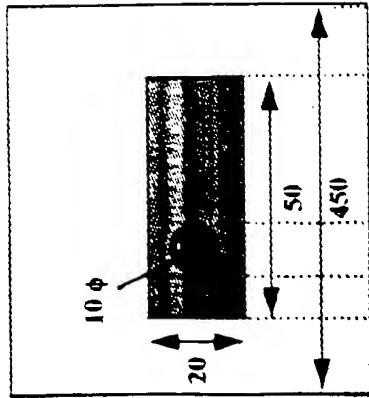
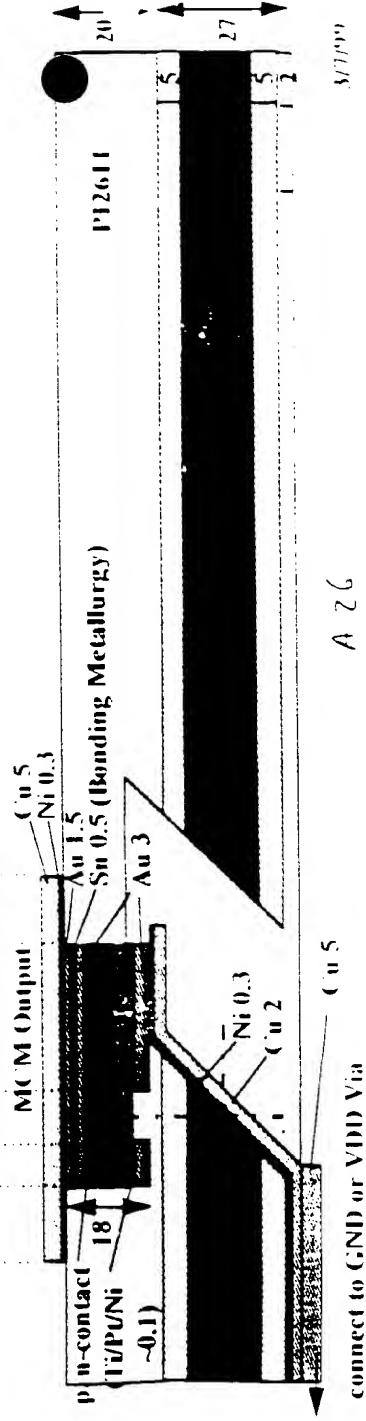


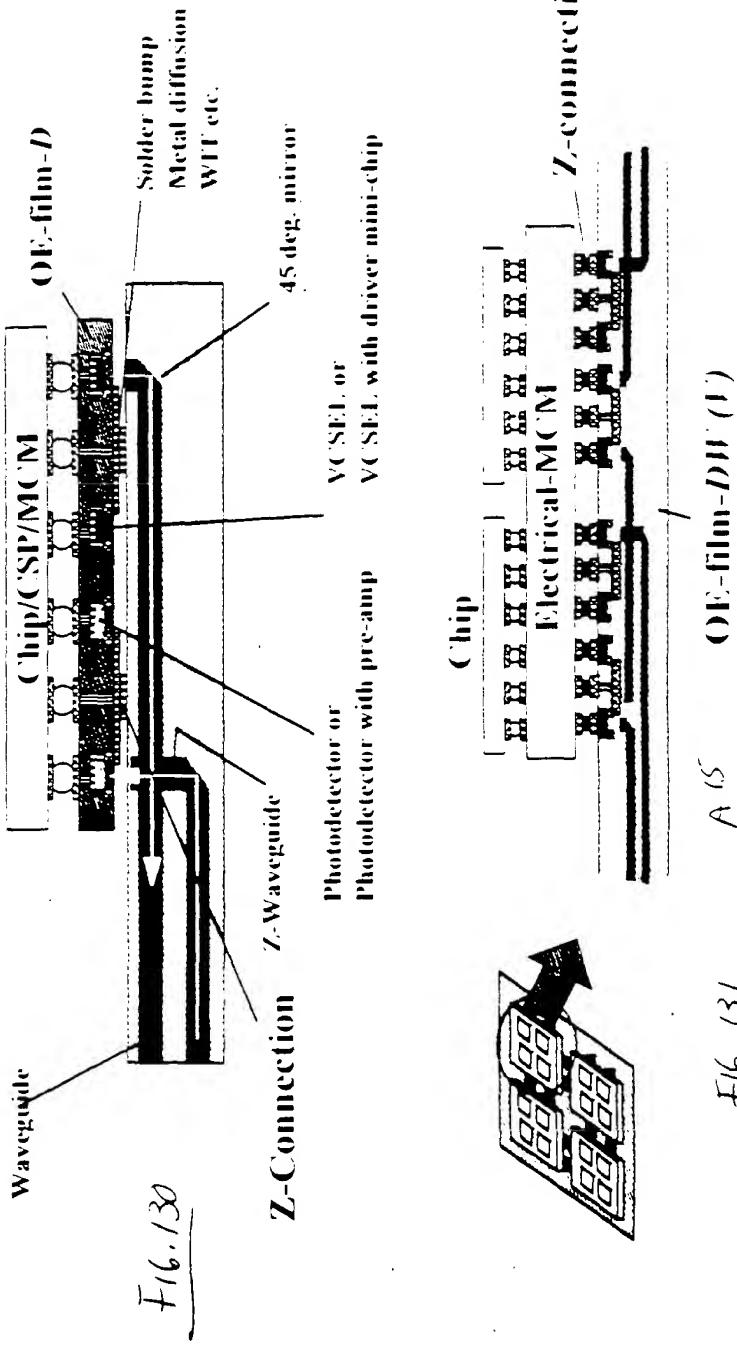
fig. 12



f16. 128

Unit :  $\mu$ m

## OK-film: OE-IP, OE-Film-MCM

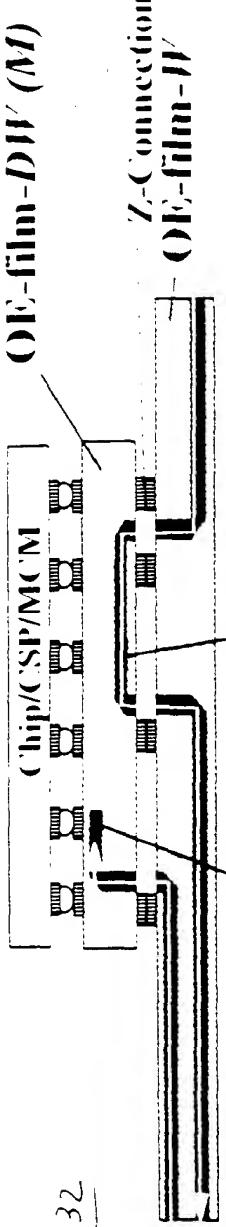


(2/23/99) Fig. New-Alt-Modified

A 15 2/23/99 — 16.131

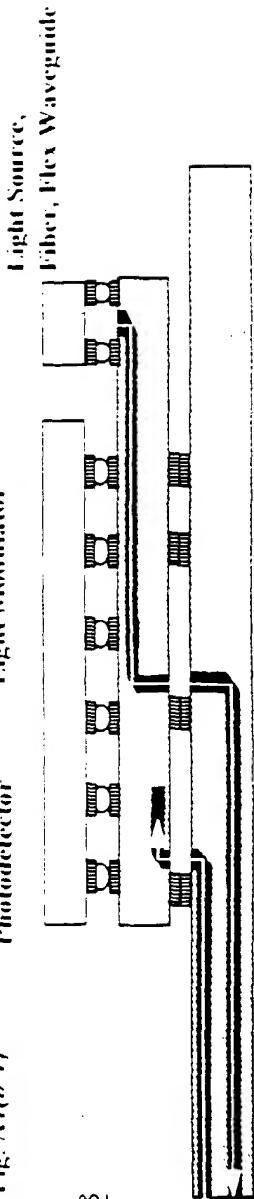
## OK-film: Light Modulator Transmitters

F/6.132



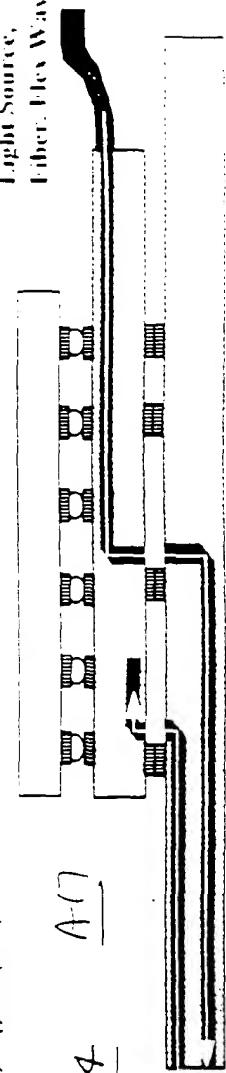
(2/17/99) Fig. A1(b-1)

F/6.133



(2/17/99) Fig. A1(b-2)

F/6.134



(2/23/99) Fig. A1(b-3)

Examples of Light Modulators: Electro-Optic (E-O) Modulator, Electro-Absorption (E-A) Modulator

### (Whole structure)

OE-film-IV OE-film-IV

F16. 135

OE Bookplate

Z-Connection

## Photodetector

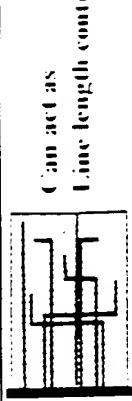
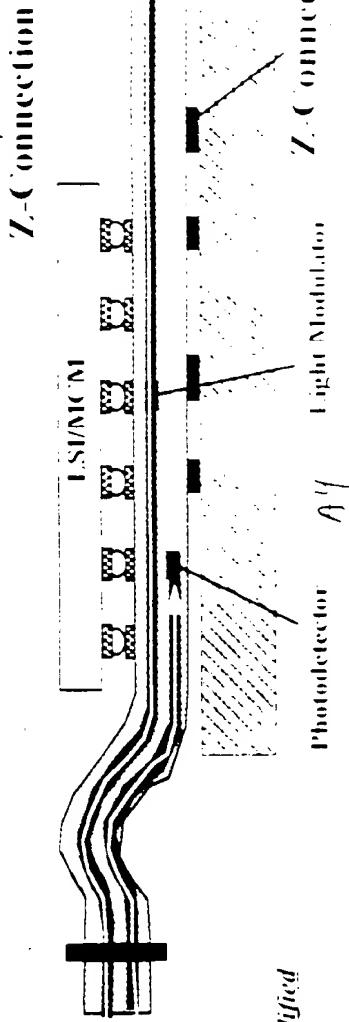
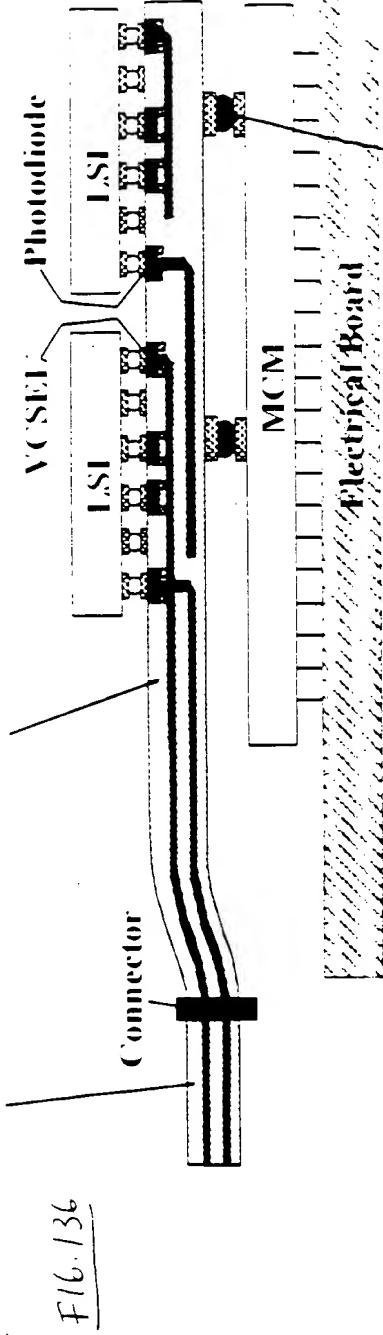
## MCM (Chip, CSP)

118

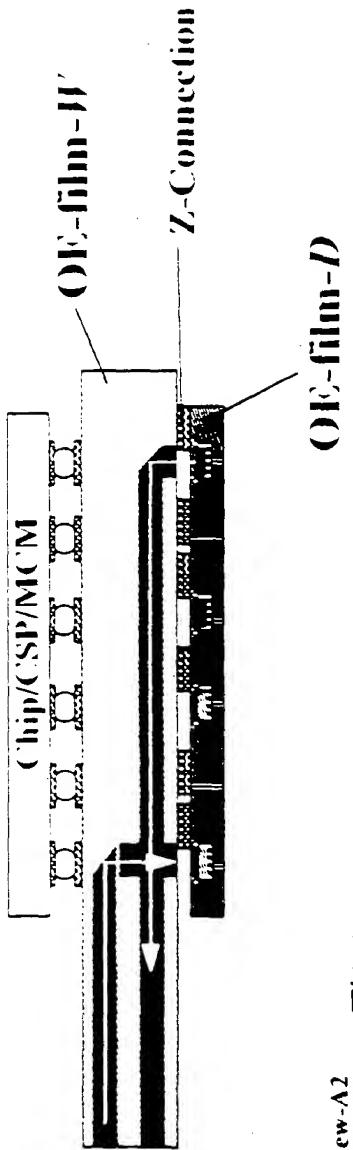
OE Backplane (OE PCB)

X 1000000

2/23/99-addendum

**Direct Jump from LSI****Fiber Ribbon Film Waveguide with Device Integration***Fig. New A4-Modified*

## OE IP is Placed on the Oposit Side

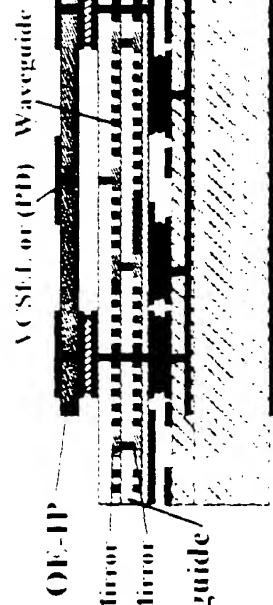


(2/23/99) Fig. New-A2 F/6.138

$42^\circ$

**OE-MCM**

VCSEL or (PPL) Waveguide  
 OE-IP  
 -45-deg Mirror  
 GS  
 MPS  
 PC  
 Film Waveguide

F16.139**Z-Connection**

OE-Film-MCM  
 Film Waveguide  
 (OE-PCB)

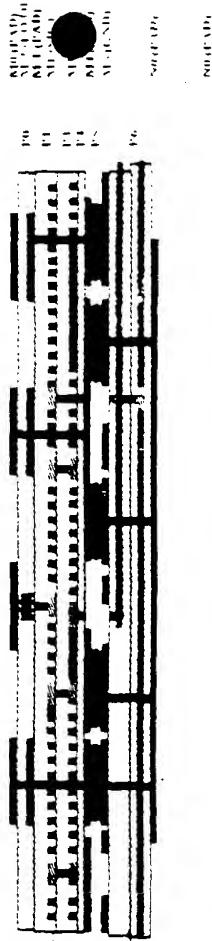
F16.140

Fig. A5-Modific

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## Opti-film: Smart Pixel

---



Fig. 141

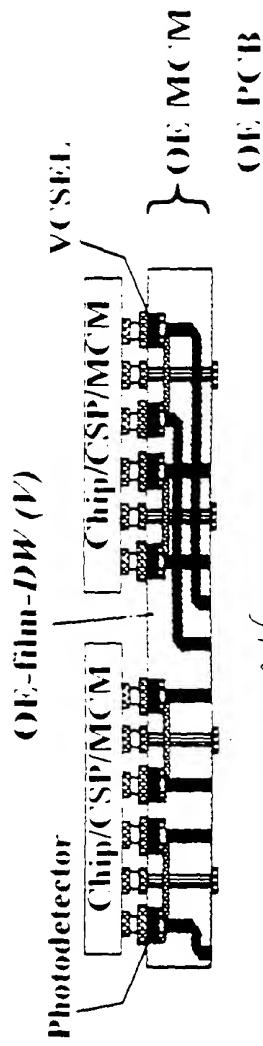


Fig. 142

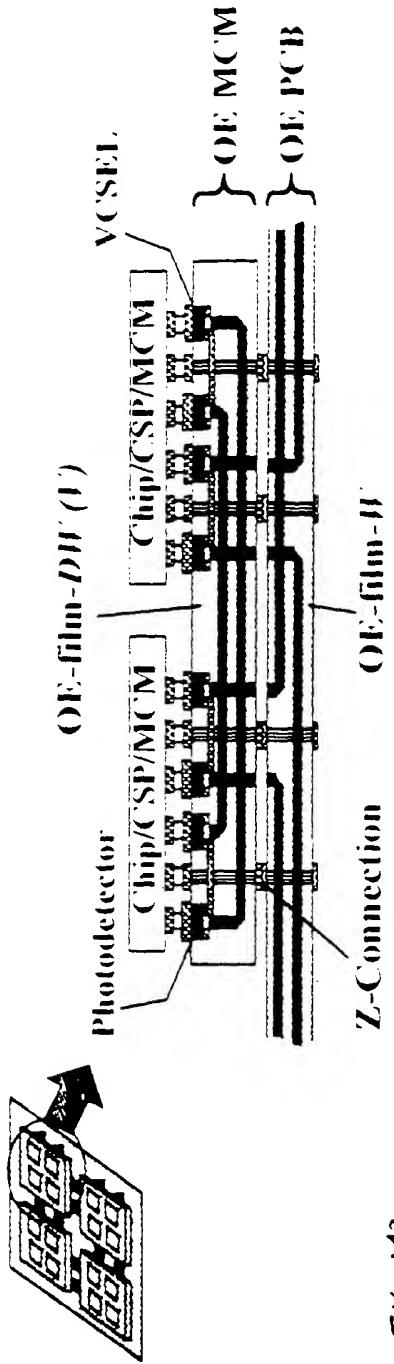


Fig. 143

2/23/99-updated 4

FUJITSU Computer Packaging Technologies, Inc. FCPT

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OE-Film/OE-Film Stack --- Back-Side Connection

---

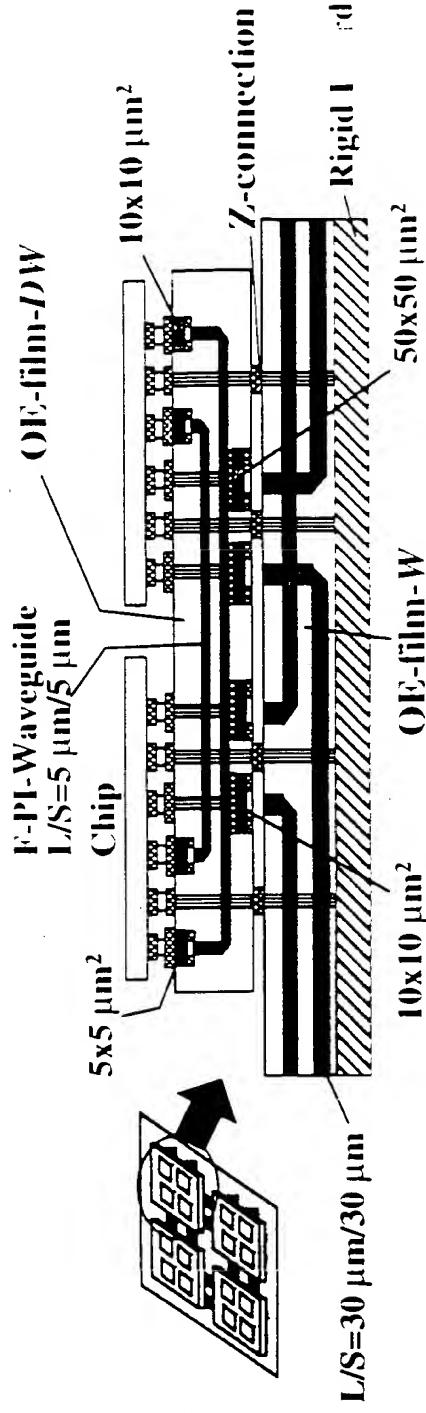


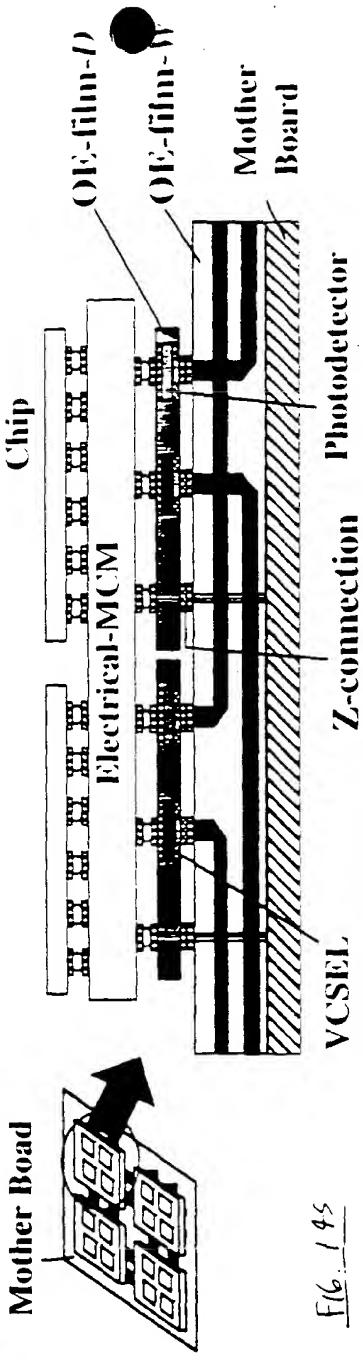
Fig. 3/18/99-1

Fig. 3/18/99-1

F16, 144

2/7

# OE-MCM/OE-Bord Stack



f6.145

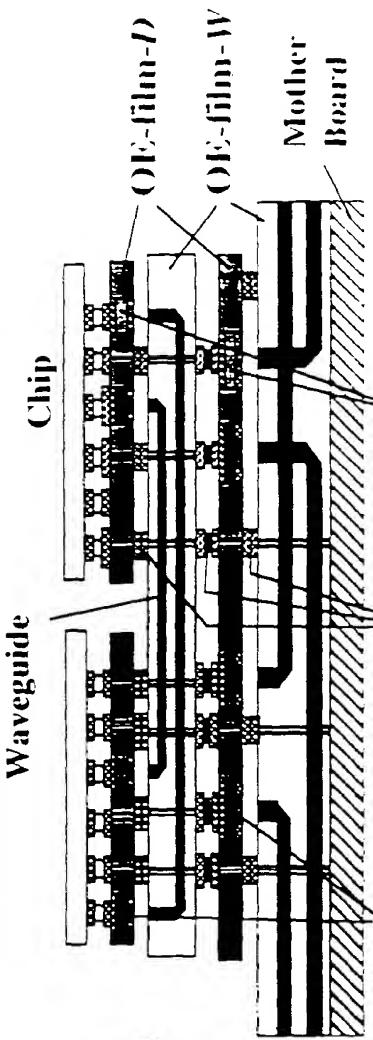


Fig. 3/19/99.1

f6.146

D3

Photodetector

D3 3/10/99

## Device Integration Process

(1) Pads/Line formation



(2) Placement of  
Thin film devices



(3) Polymer coat



(4) Planarization



(5) Vias/Pads/Lines formation



(6) Substrate removal



OE-film-D

At 1

(6') Jump to the waveguide formation process



OE-film-DW(1)

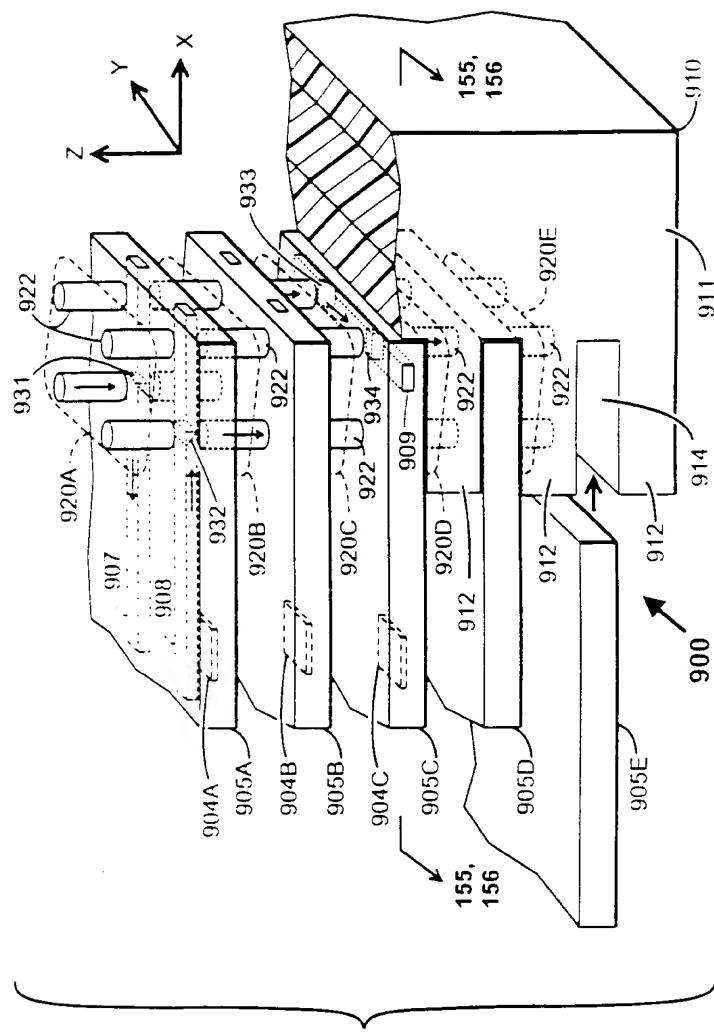


FIG. 154

1/XX

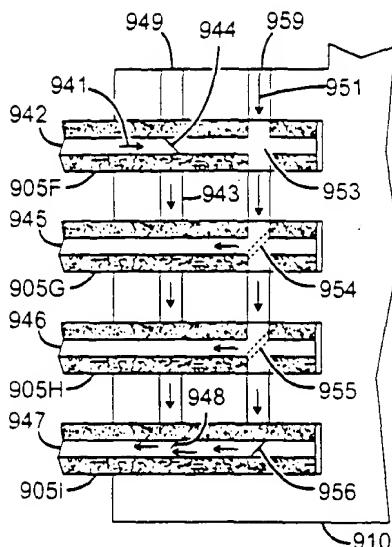


FIG. 155

09767562 - 012301

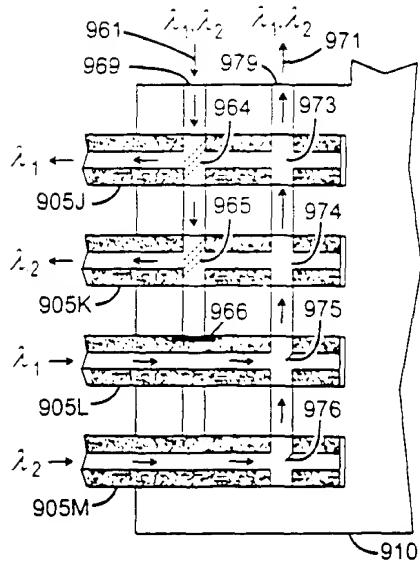


FIG. 156-1

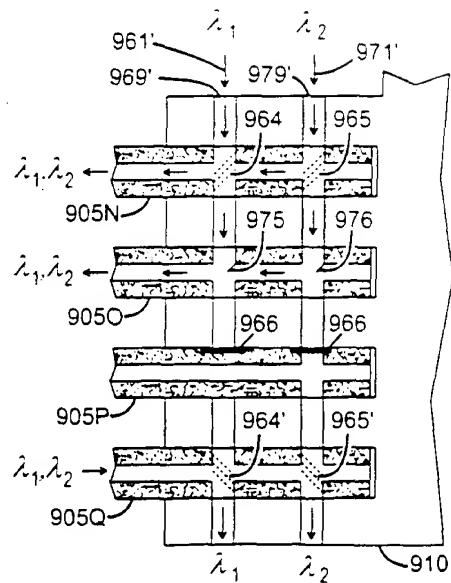


FIG. 156-2

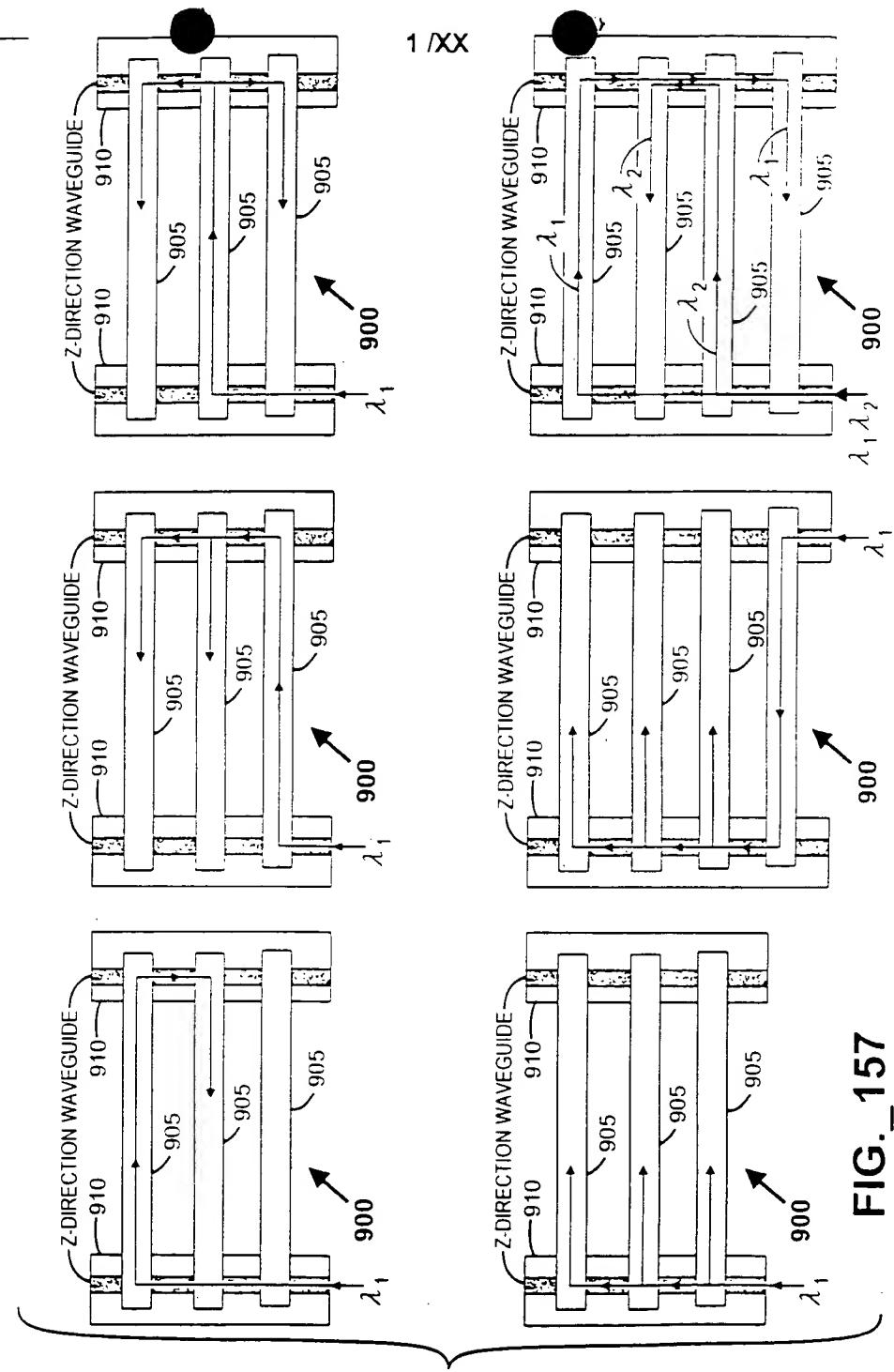


FIG. 157

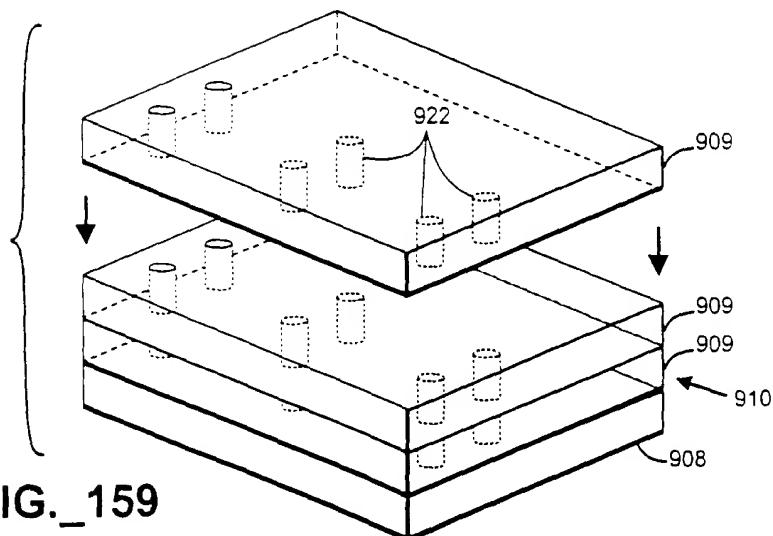
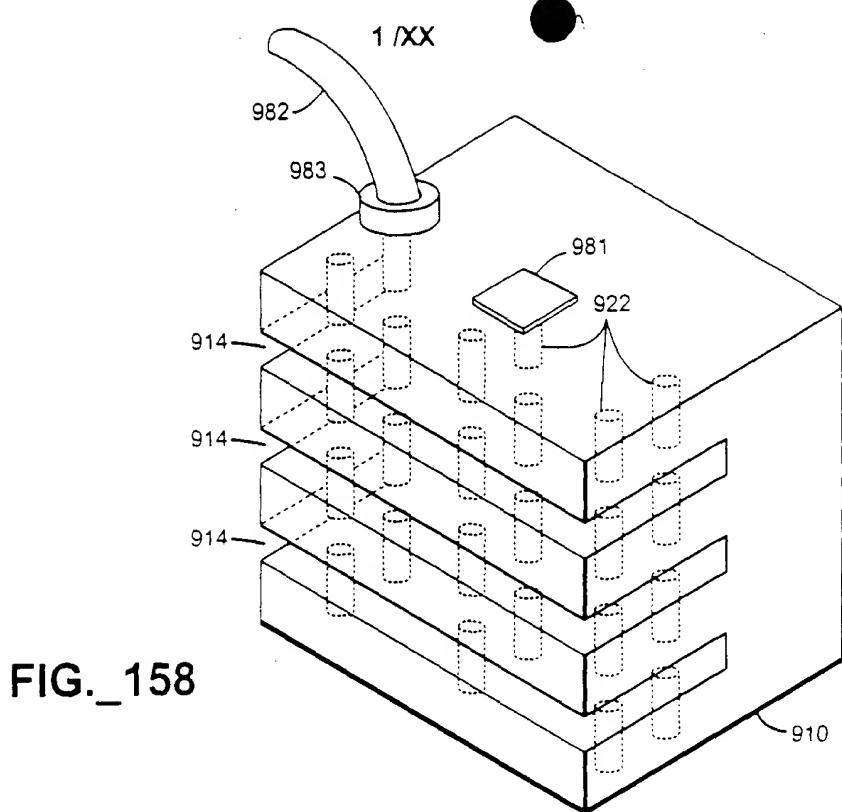
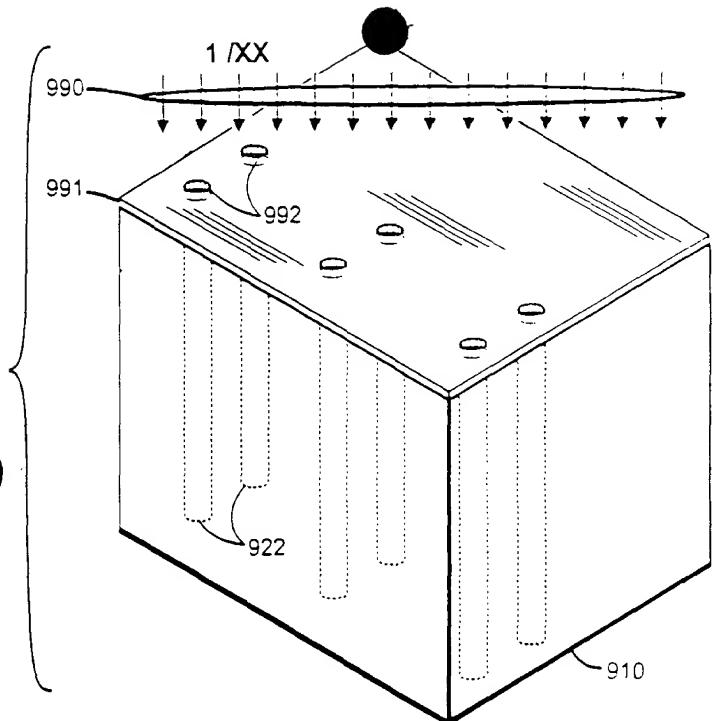
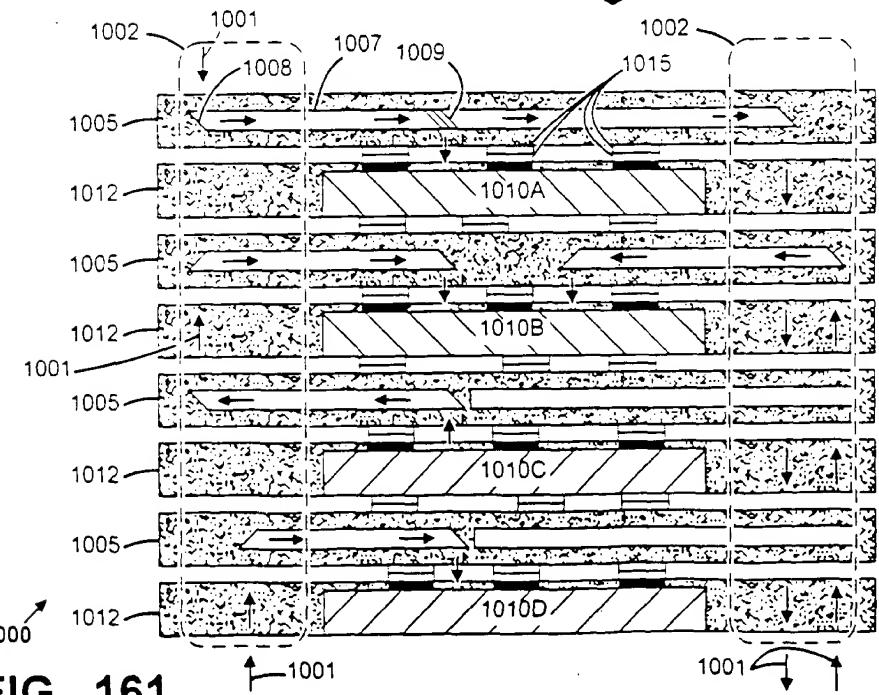


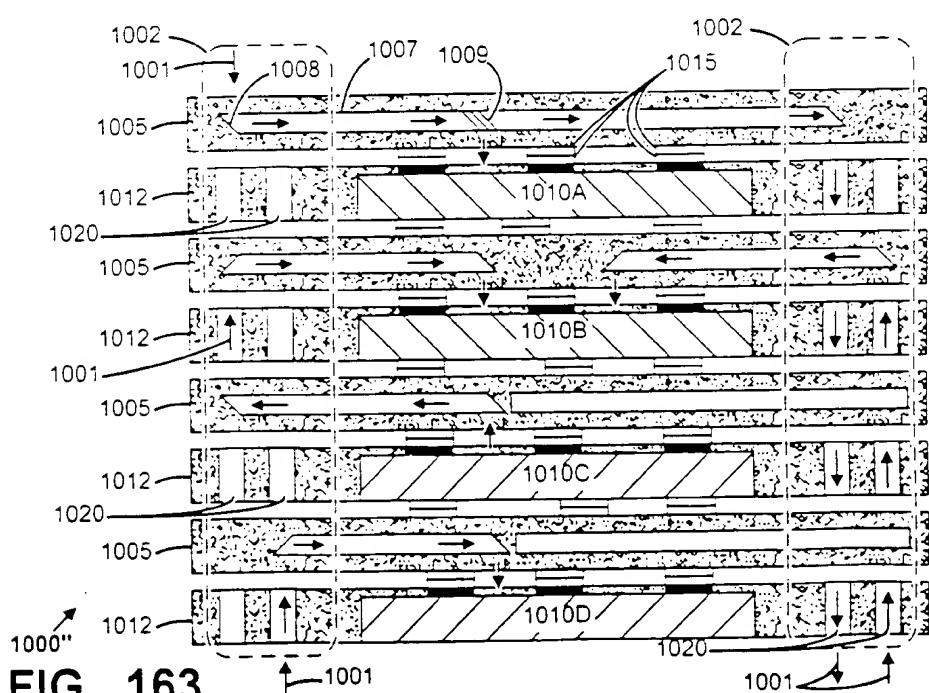
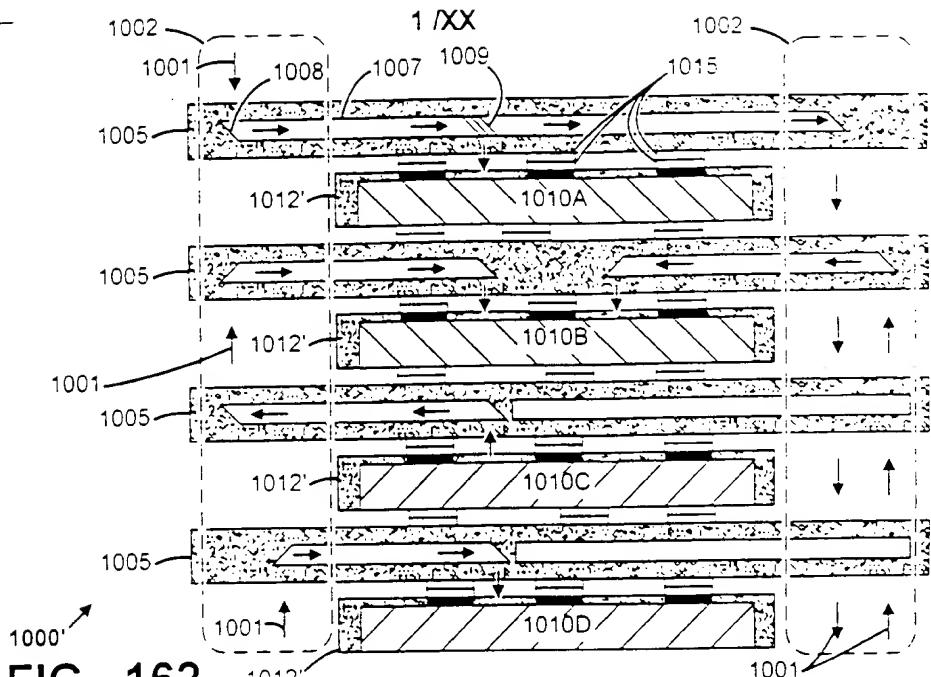
FIG. 160

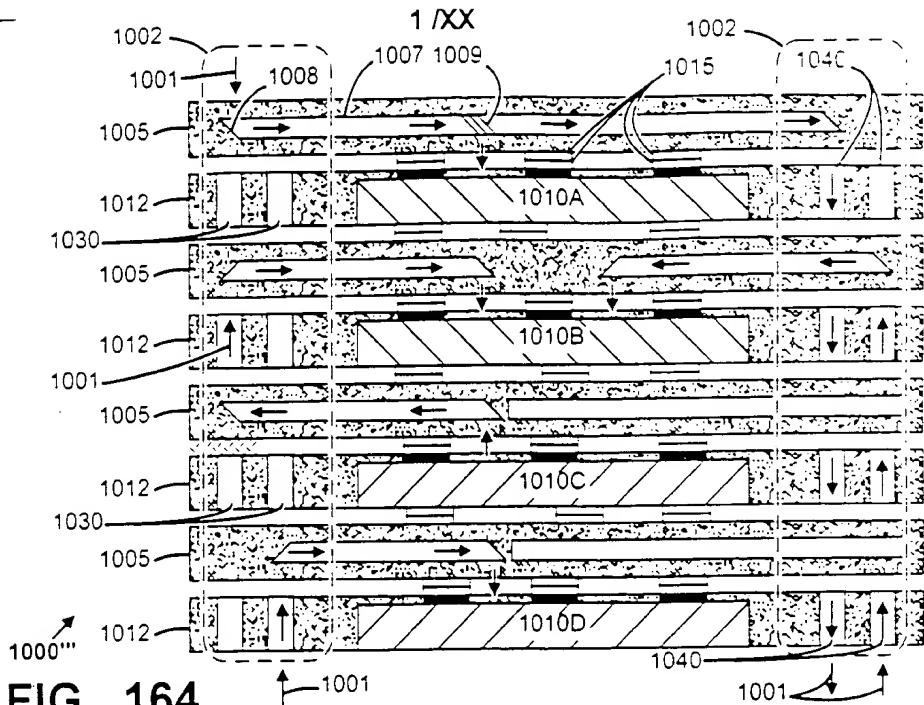


1001-2054-0220

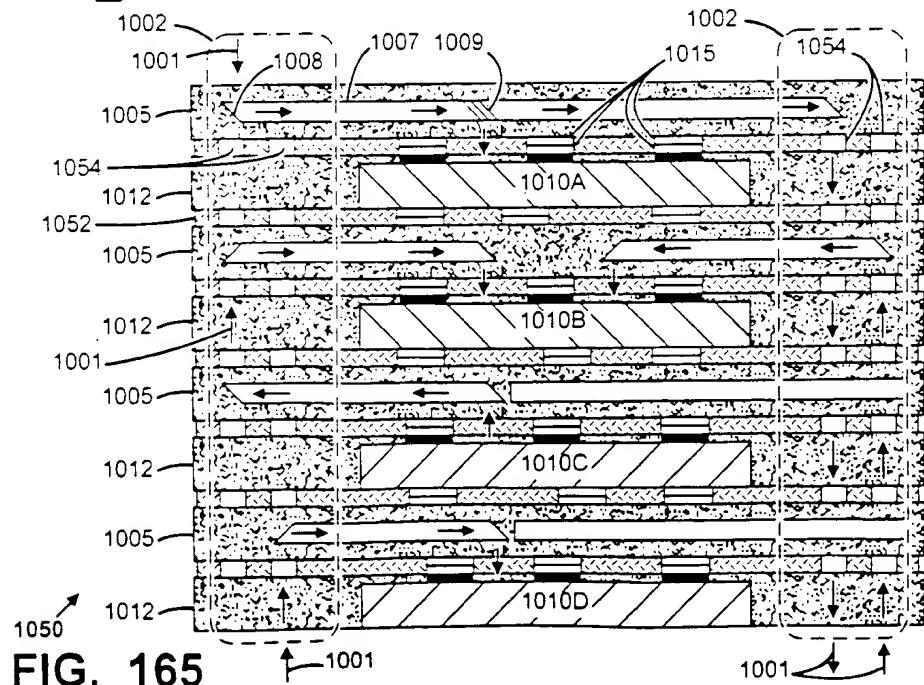
FIG. 161







**FIG. 164**



**FIG. 165**

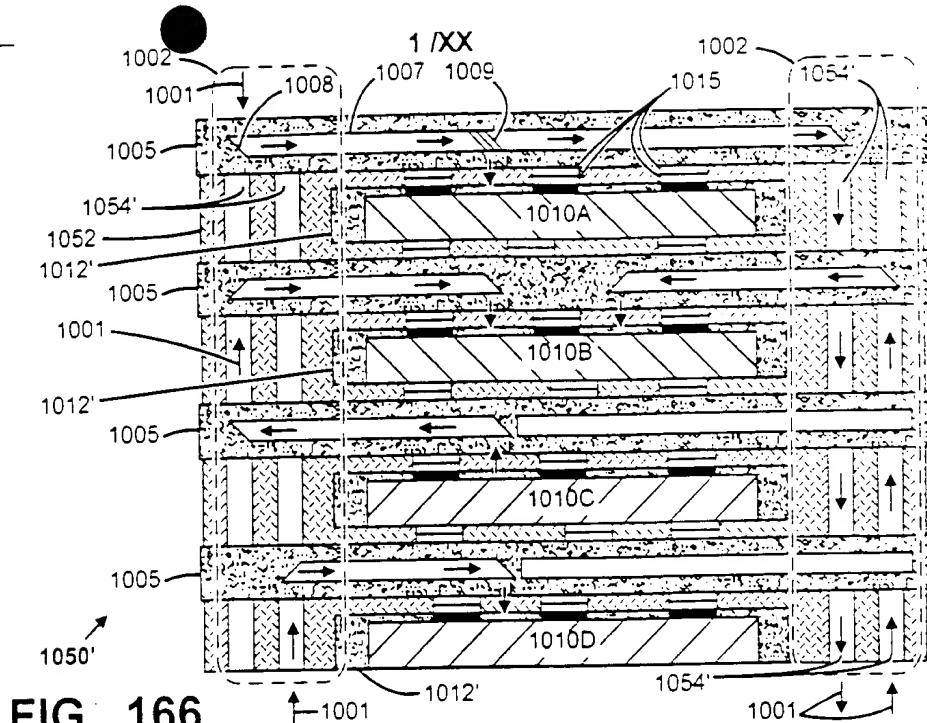


FIG. 166

TO 20240 202549 X 60

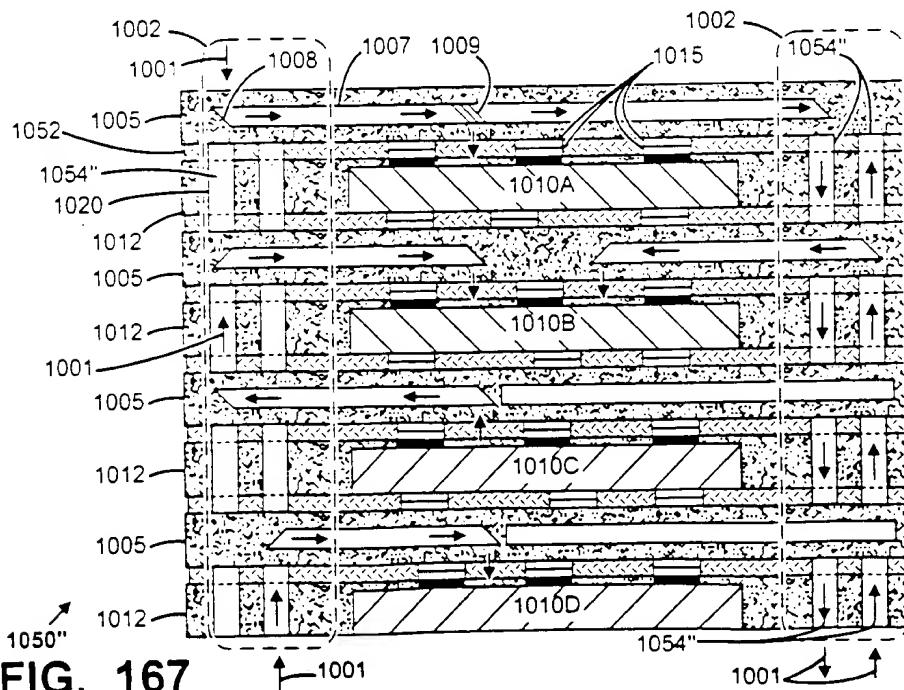
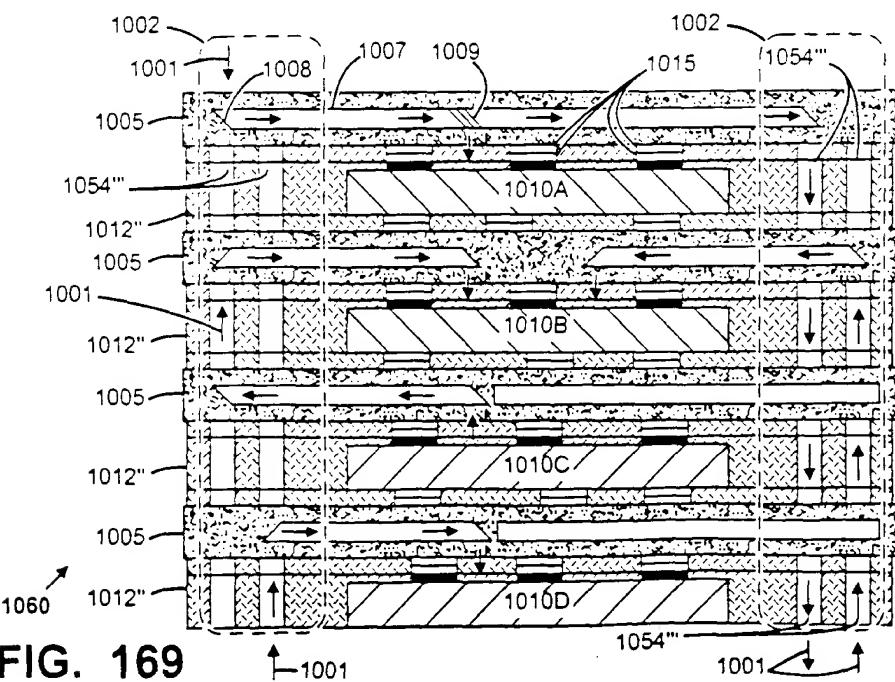
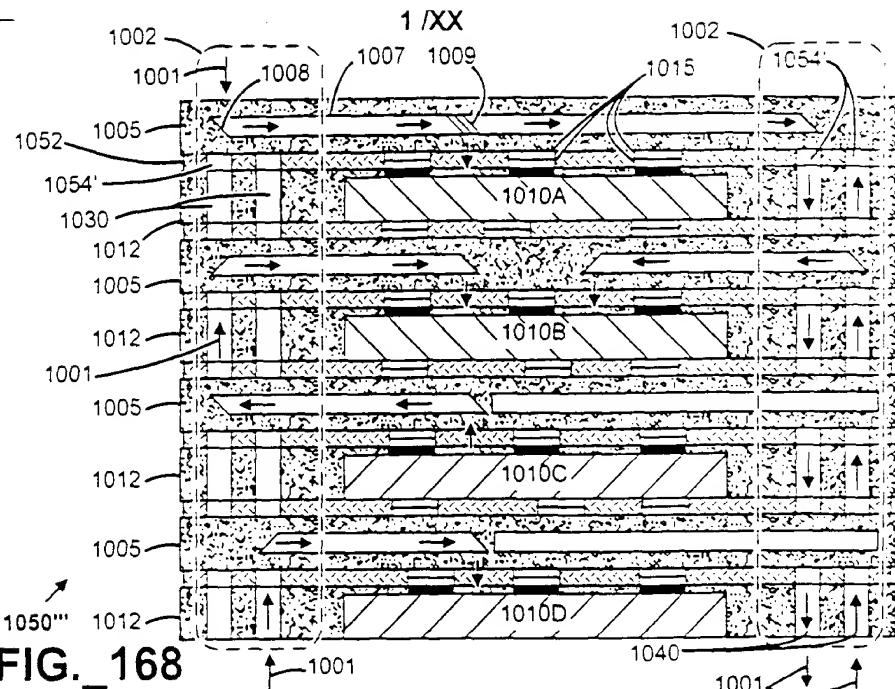


FIG. 167



1 / XX

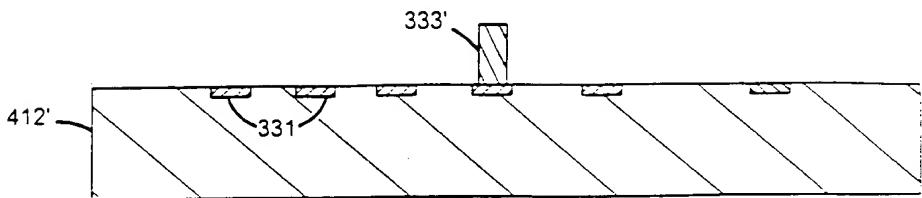


FIG. 170

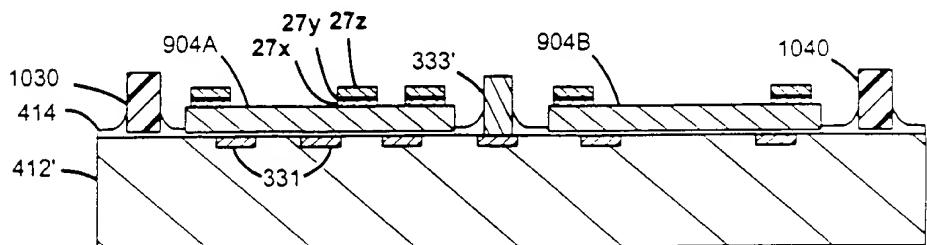


FIG. 171

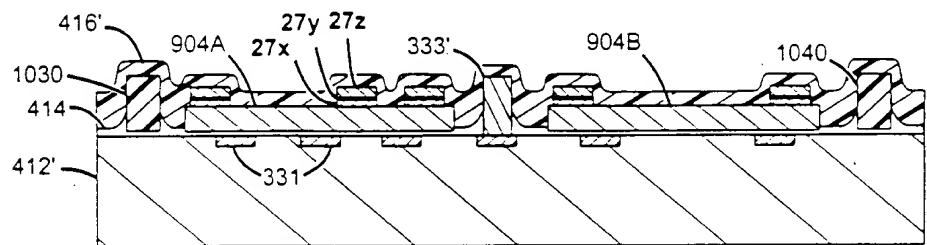


FIG. 172

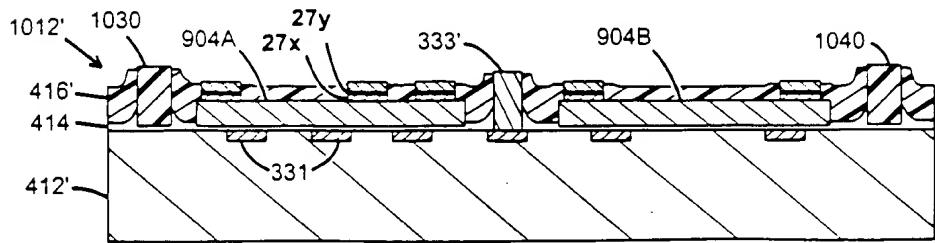


FIG. 173

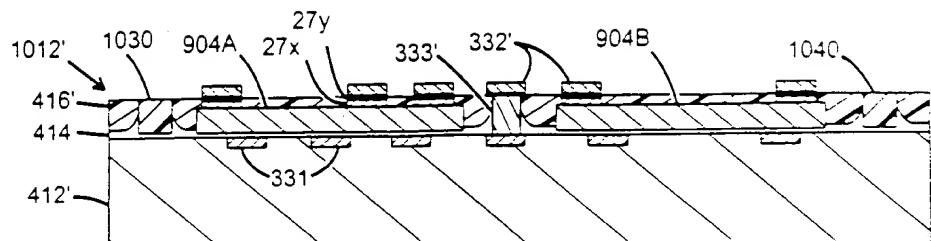


FIG. 174

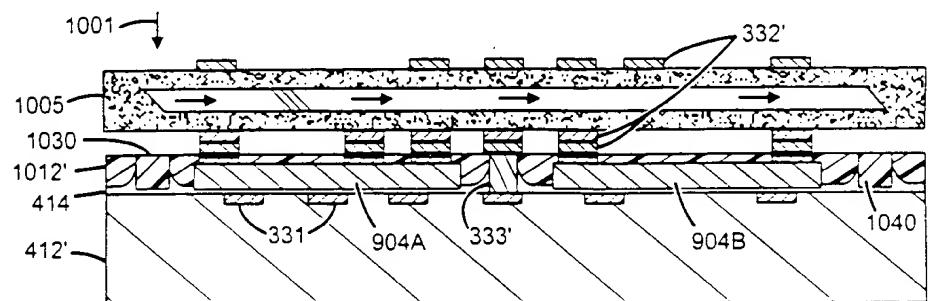


FIG. 175

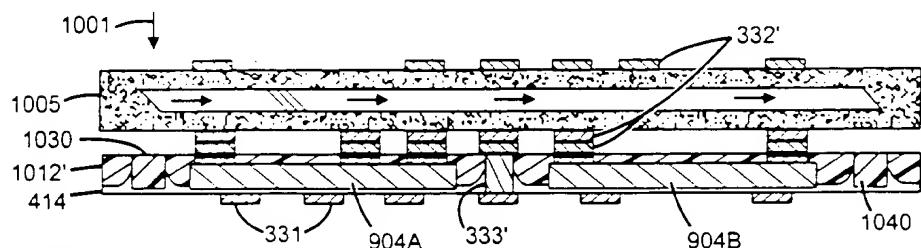


FIG. 176

1 /XX

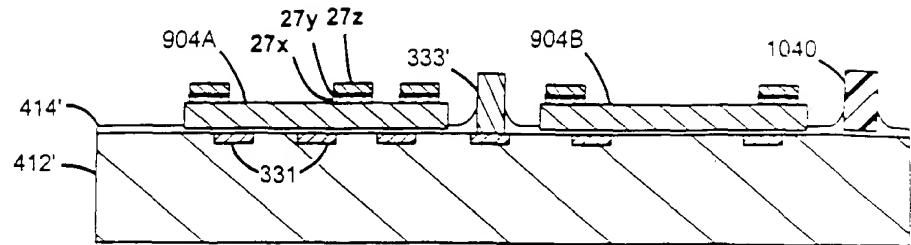


FIG. 177

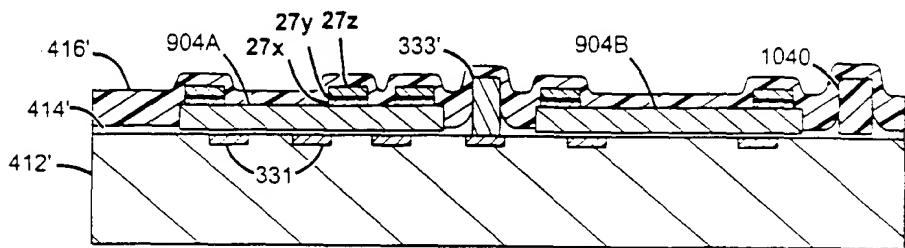


FIG. 178

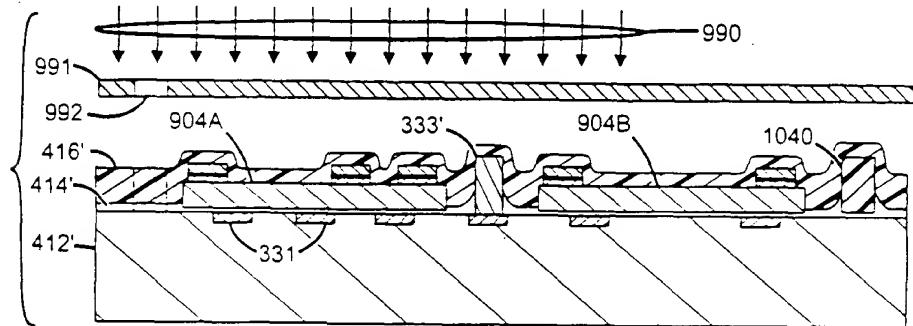


FIG. 179

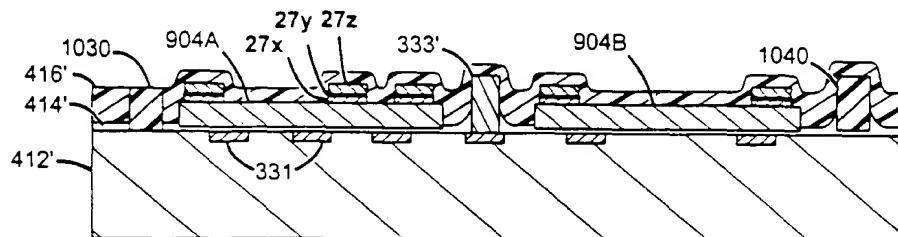
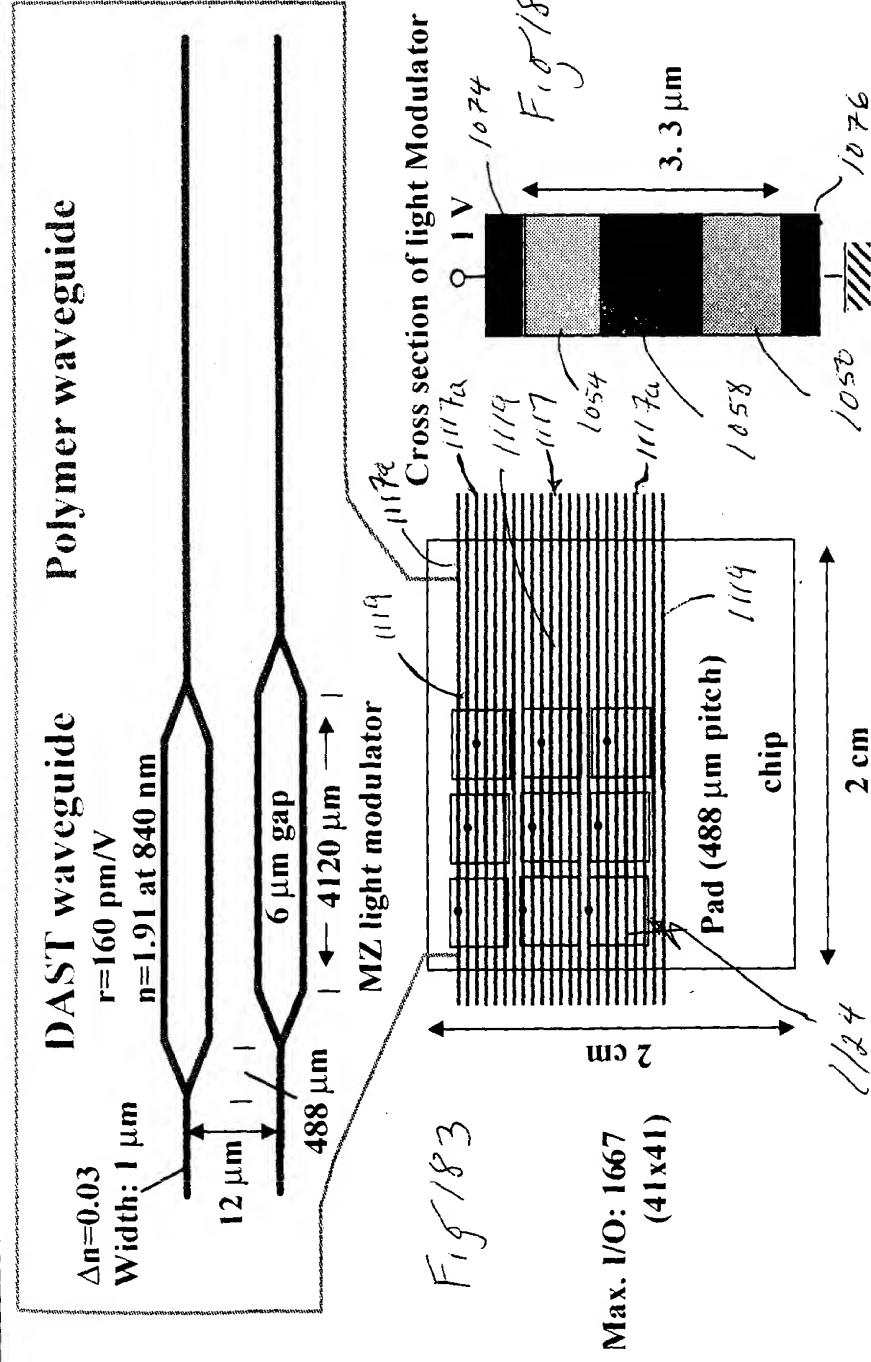


FIG. 180



## I/O Connection in OE Substrate (Planar Modulator)



## I/O Connection in OE Substrate (OE-VLSI)

Signal I/O count: 6000 = [1500 I/O per Layer] x [4-Layer]

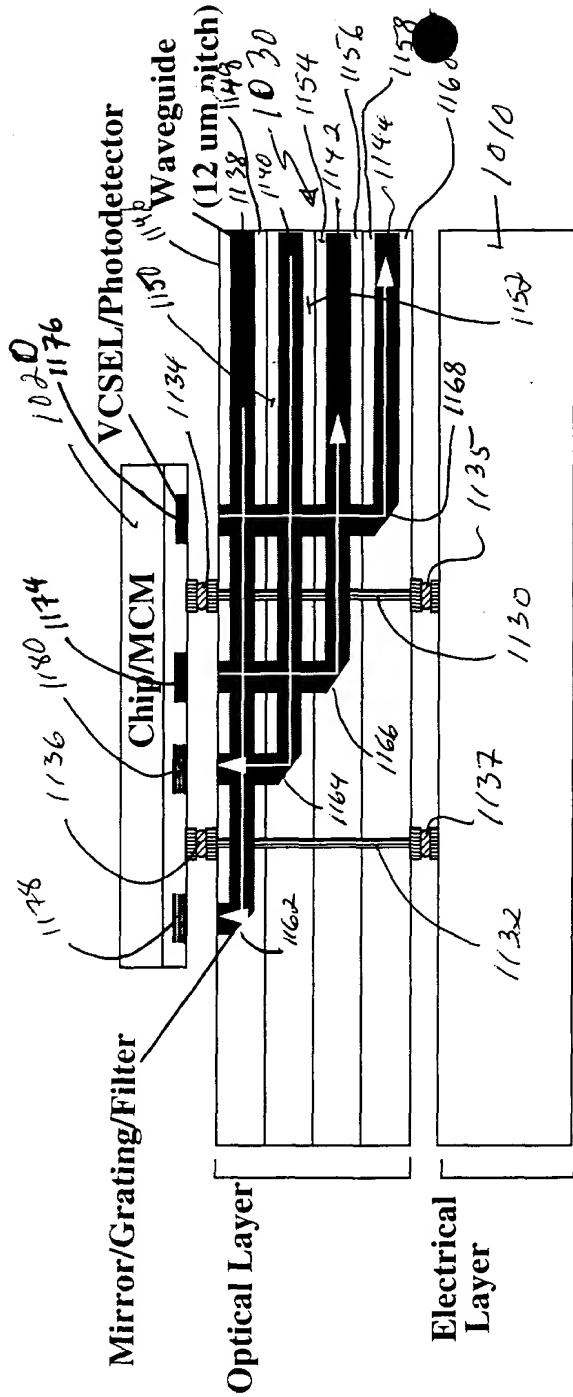


Fig 185

## I/O Connection in OE Substrate (OE-VLSI)

Signal I/O count: 6000 = [1500 I/O per Layer] x [4-Layer]

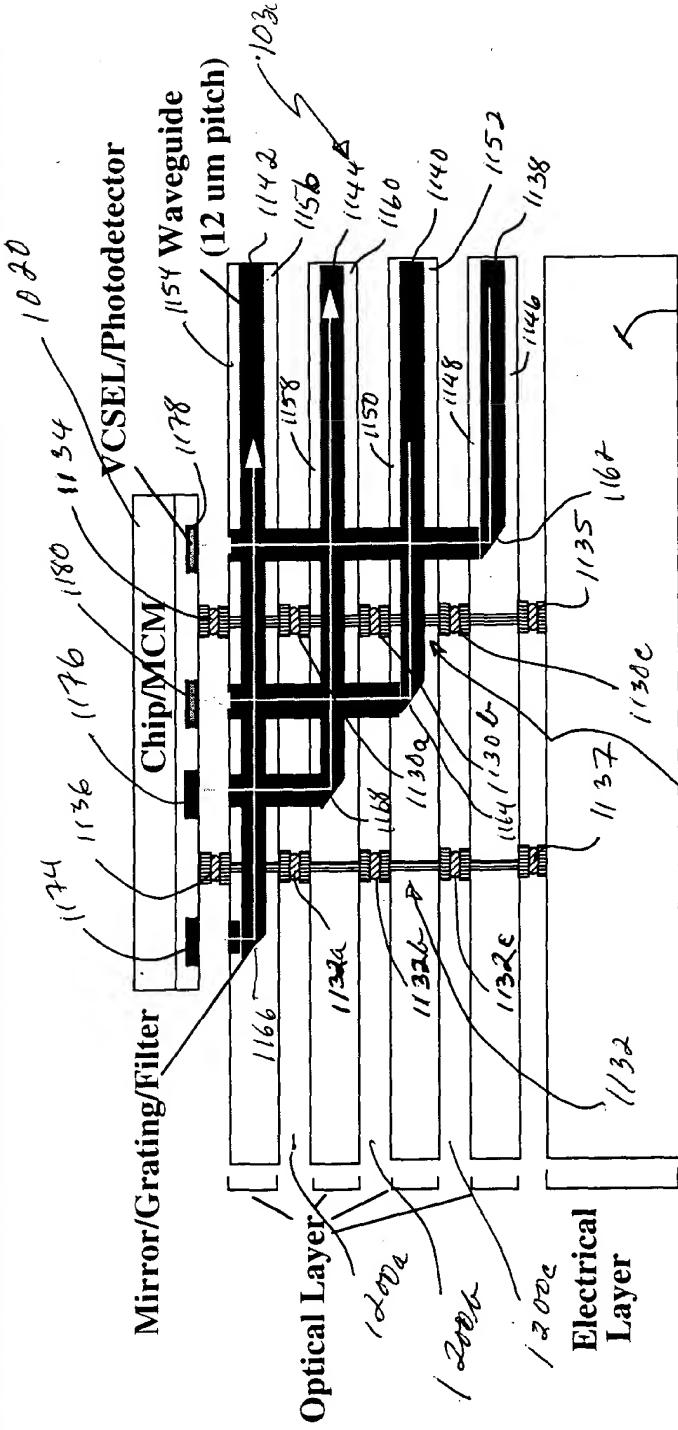


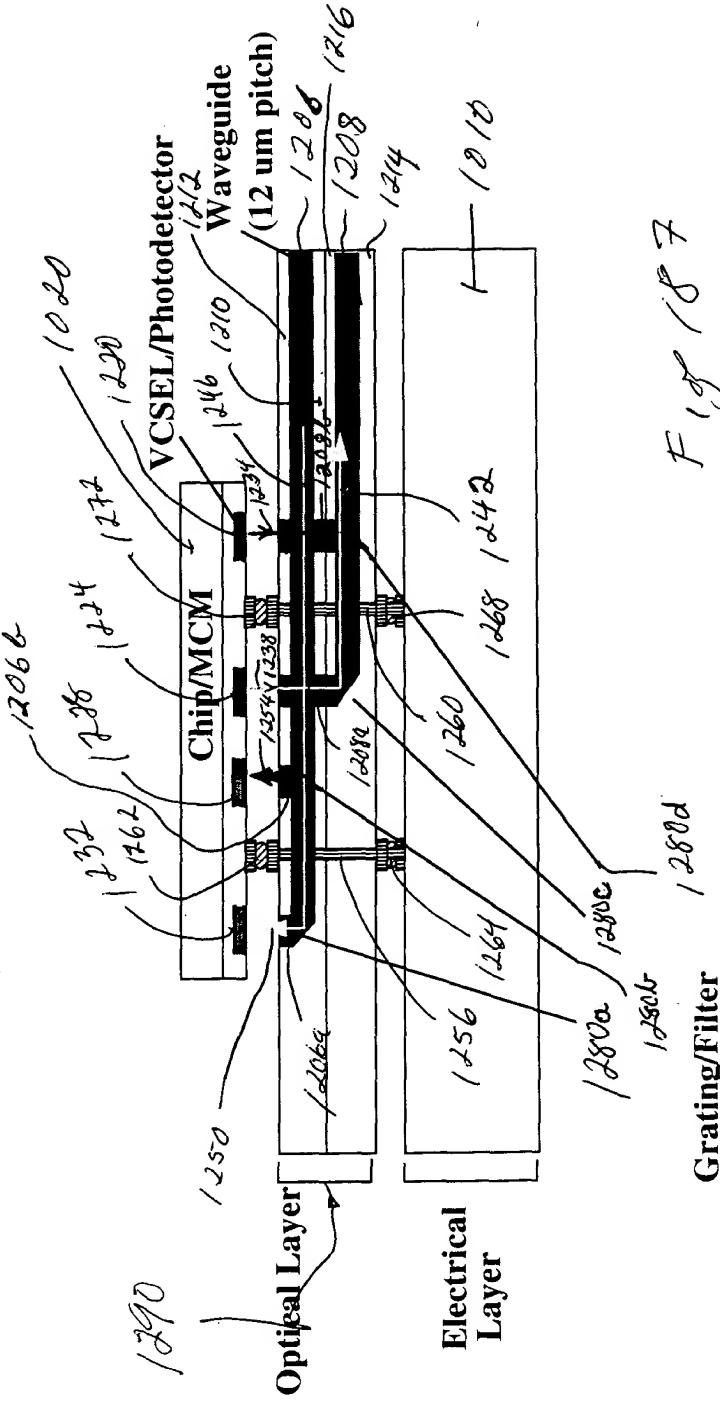
Fig 186  
1130

100

Fig.

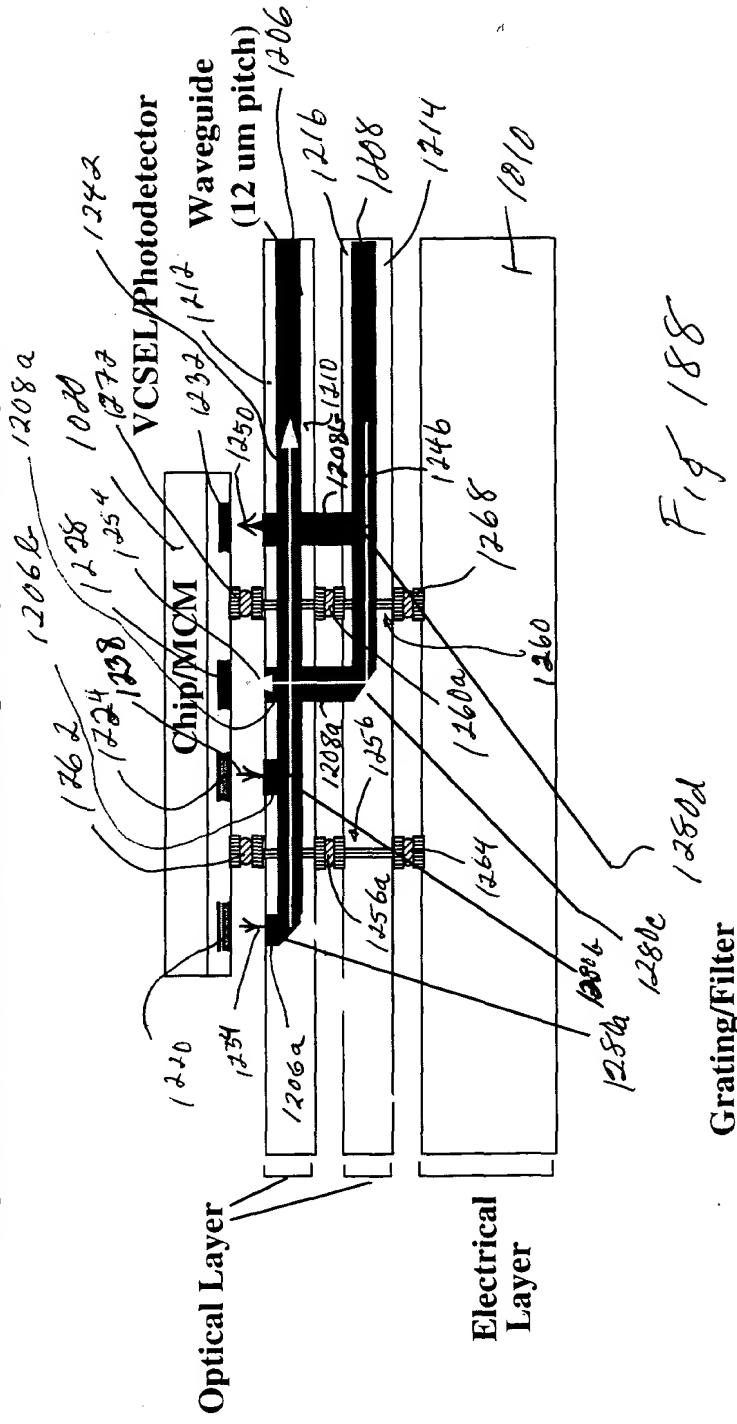
## I/O Connection in OE Substrate (OE-VLSI, WDM)

Signal I/O count: 6000 = [1500 I/O per Layer] x [4-Layer]



## I/O Connection in OE Substrate (OE-VLSI, WDM)

Signal I/O count: 6000 = [1500 I/O per Layer] x [4-Layer]



## I/O Connection in OE Substrate (Active OE Layer)

Signal I/O count:  $6000 = [1500 \text{ I/O per Layer}] \times [4\text{-Layer}]$

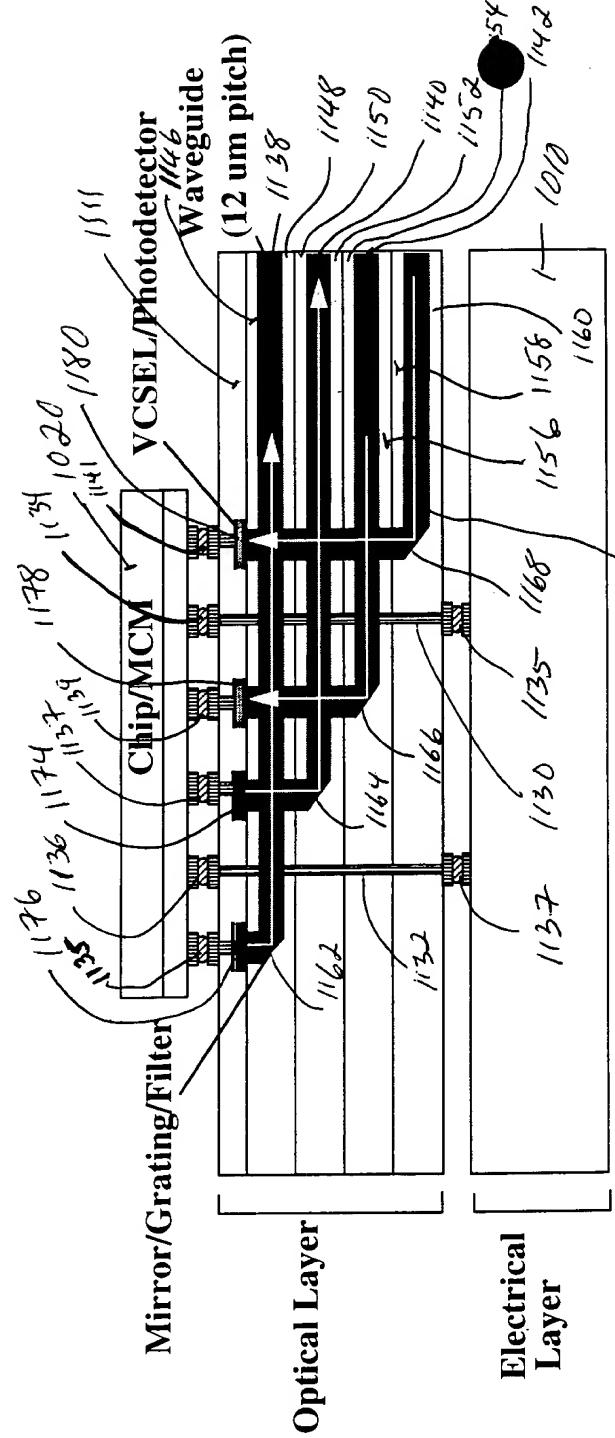


Fig 189  
1144

## I/O Connection in OE Substrate (Active OE Layer)

Signal I/O count: 6000 = [1500 I/O per Layer] x [4-Layer]

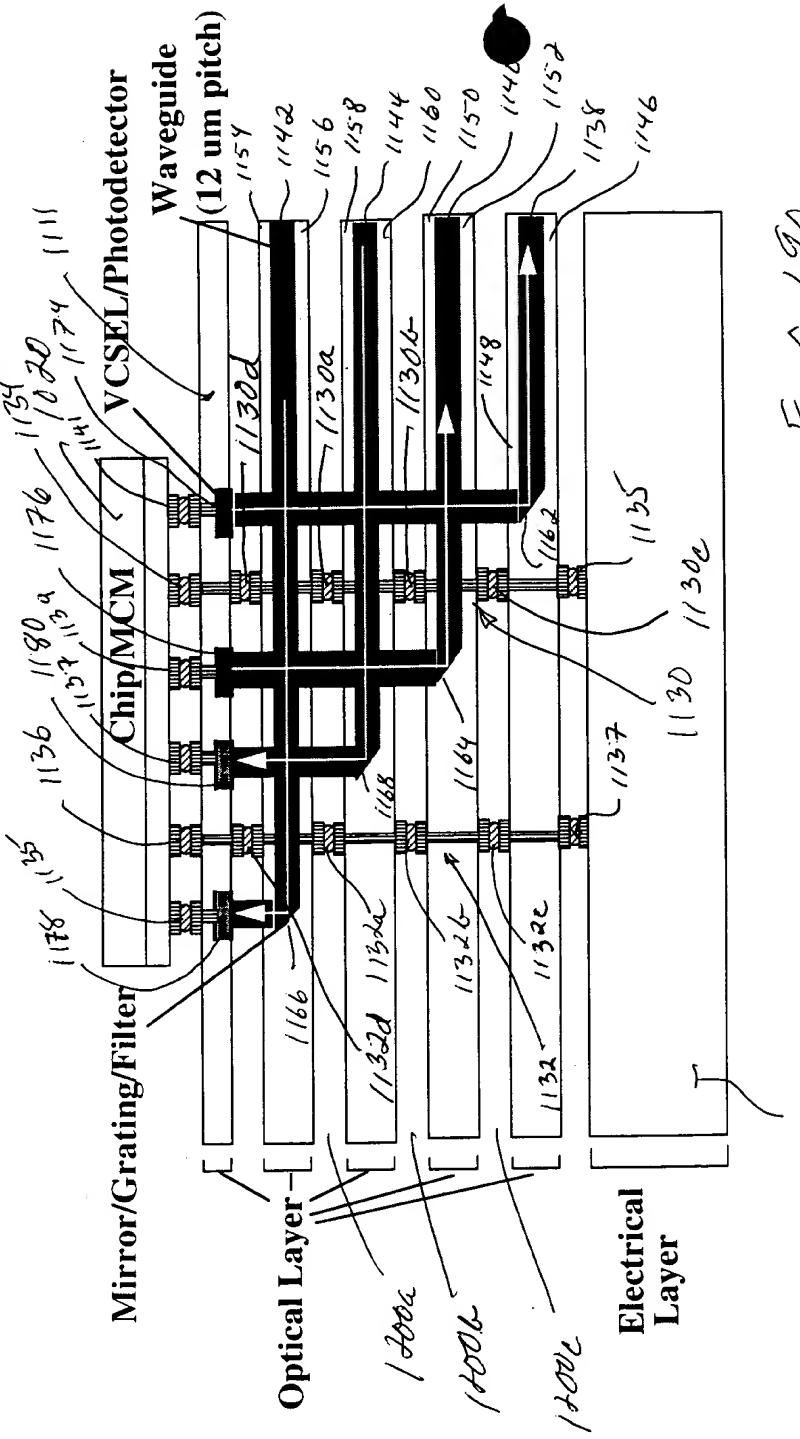


Fig. 9

## I/O Connection in OE Substrate (Active OE Layer, WDM)

Signal I/O count: 6000 = [1500 I/O per Layer] x [4-Layer]

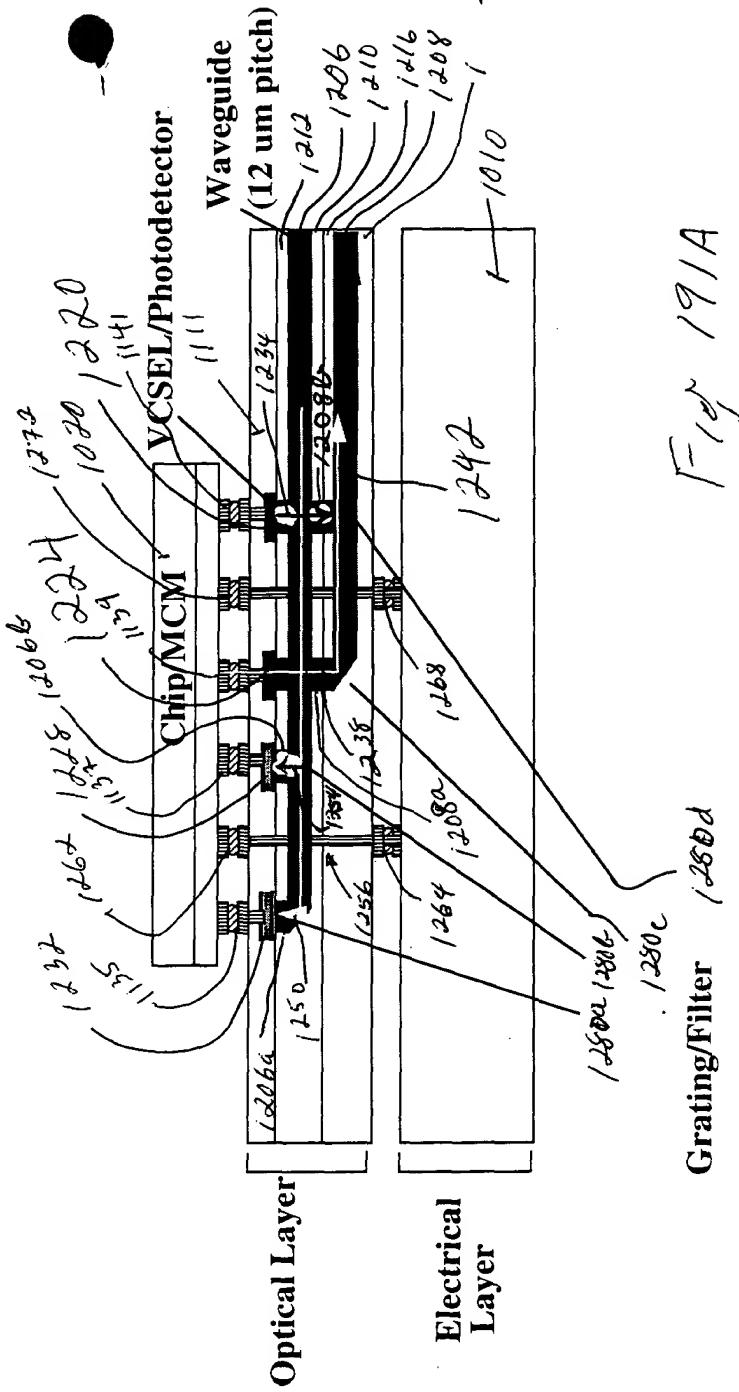


Fig. 10

## I/O Connection in OE Substrate (Active OE Layer, WDM)

Signal I/O count: 6000 = [1500 I/O per Layer] x [4-Layer]

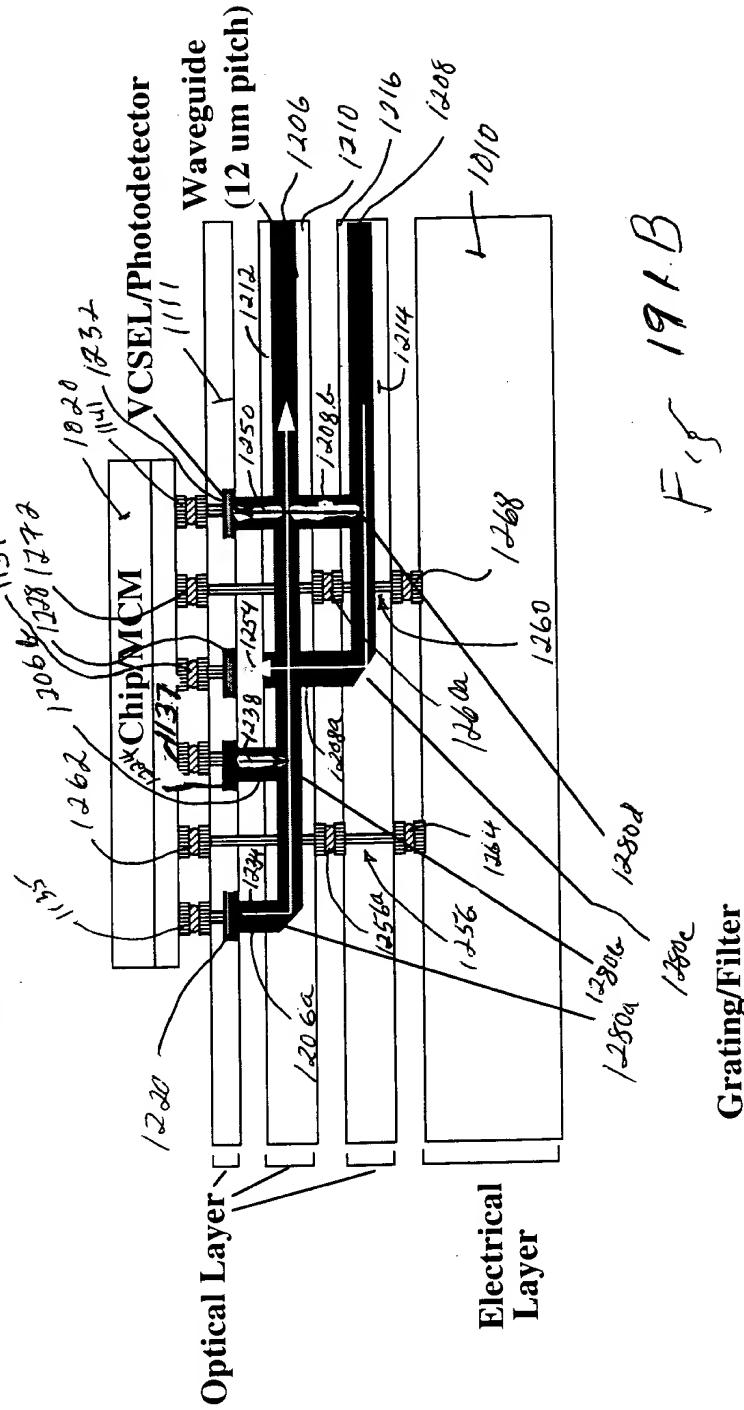
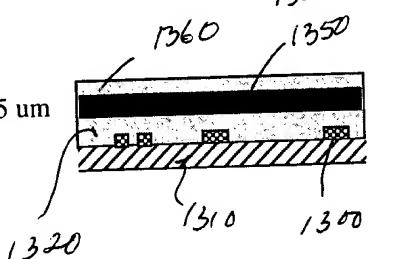
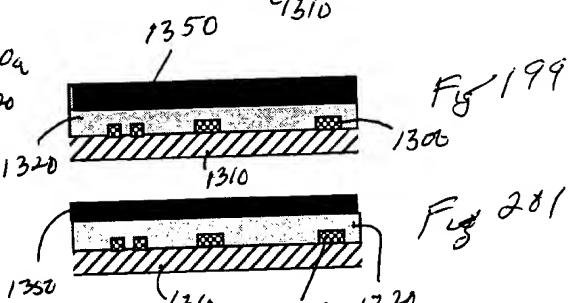
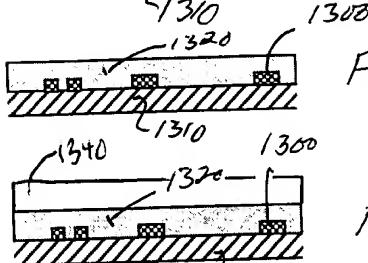
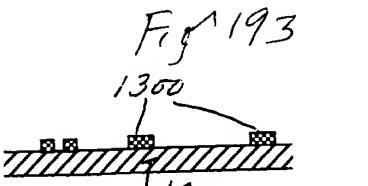
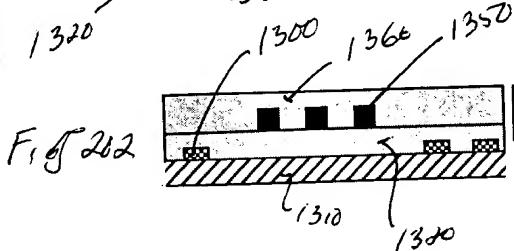
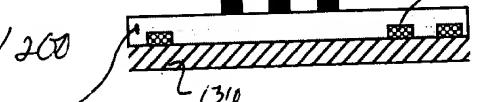
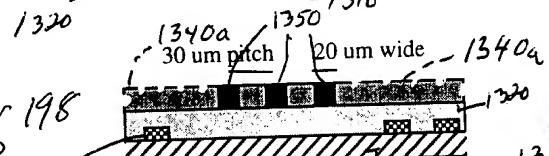
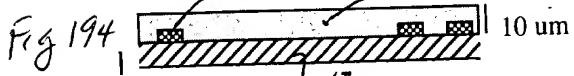
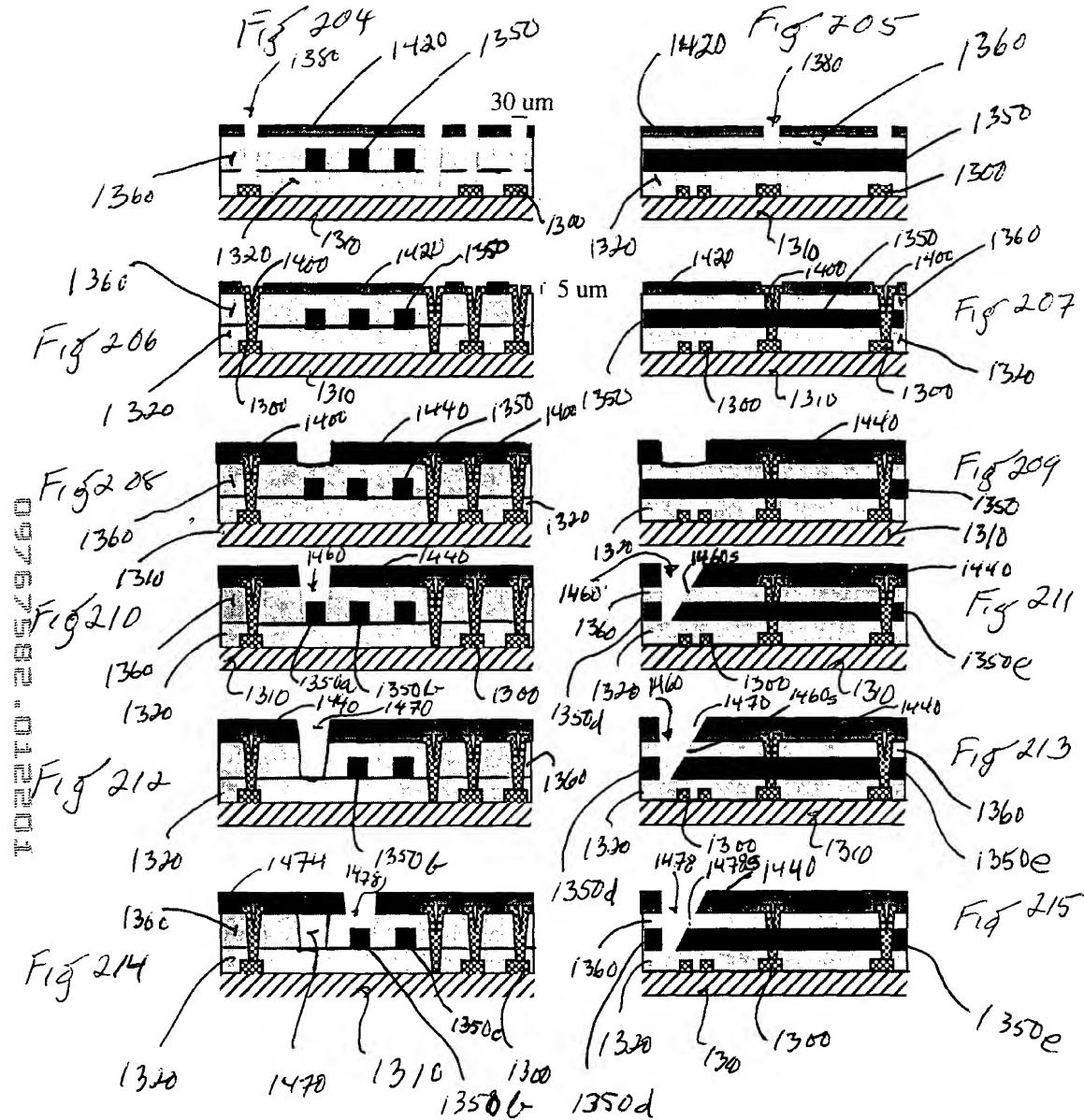


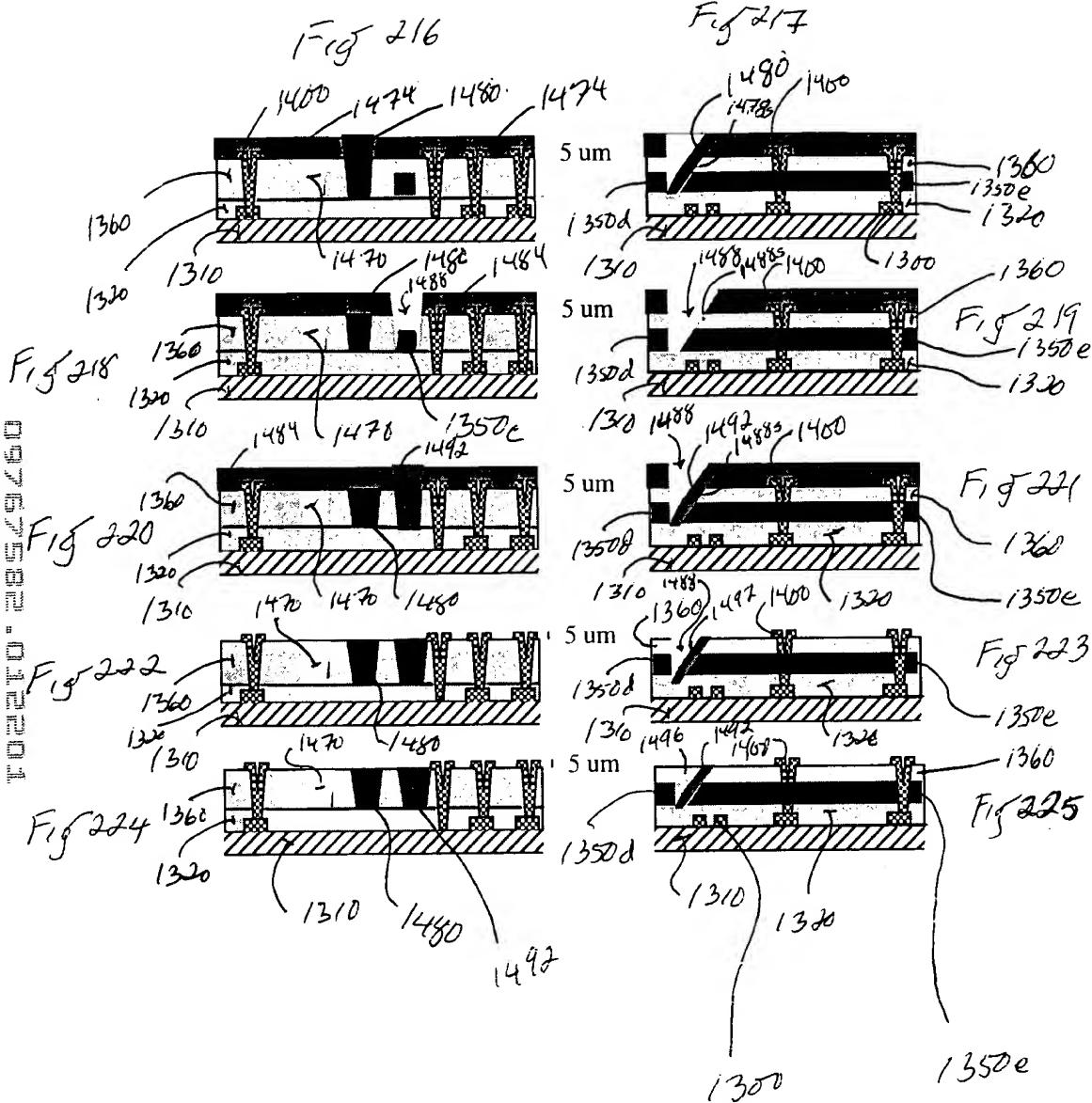
Fig. 11

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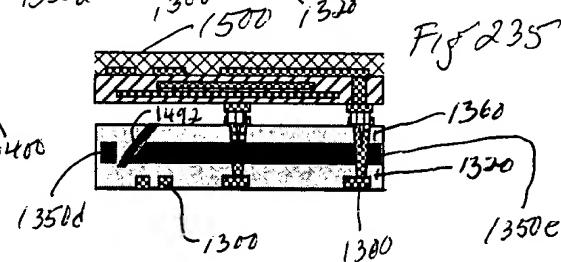
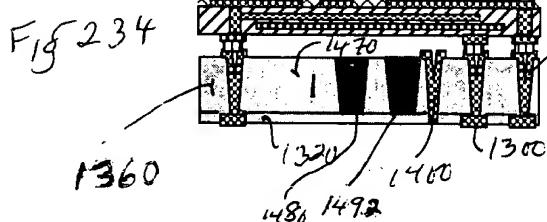
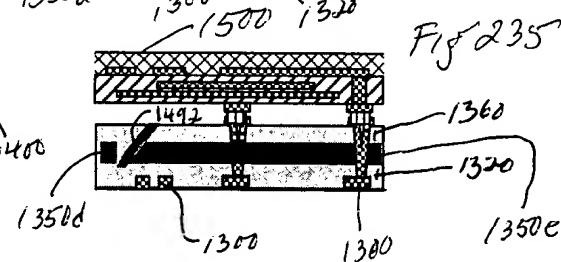
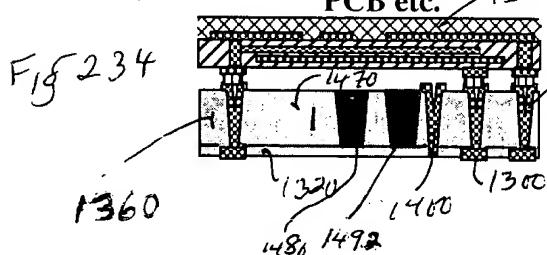
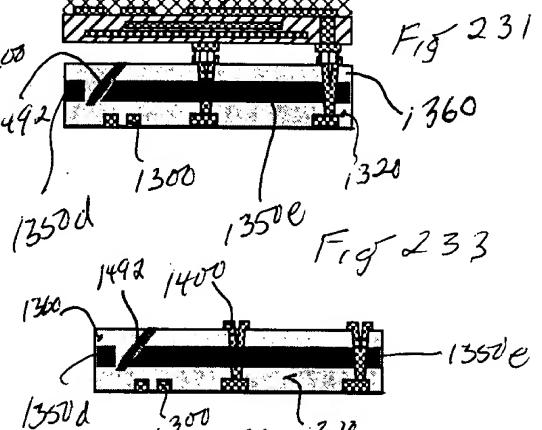
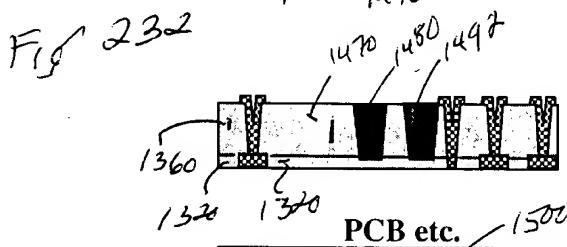
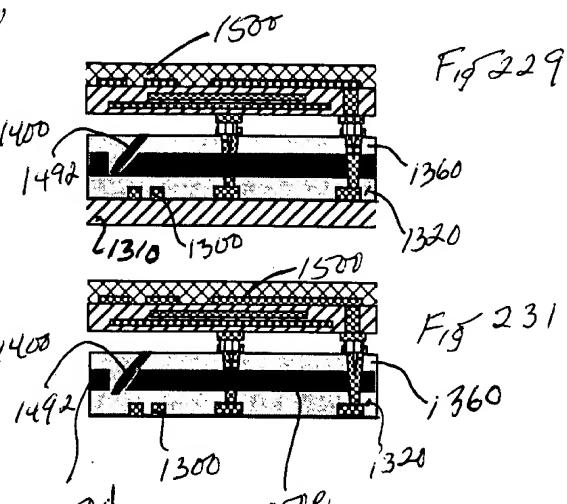
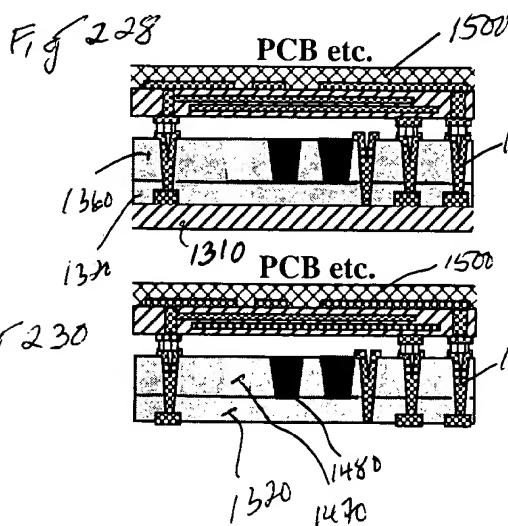
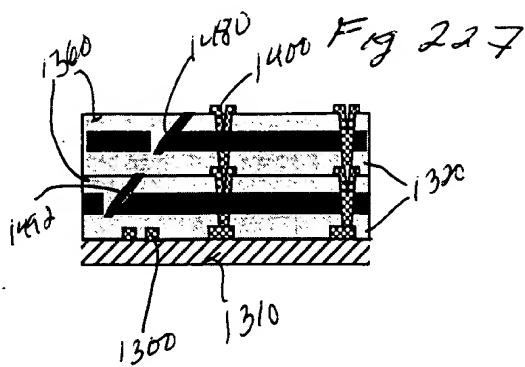
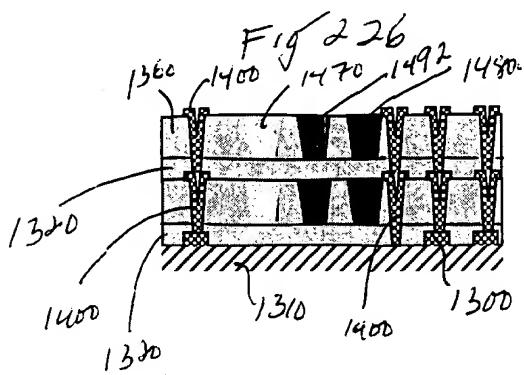


Fig 236

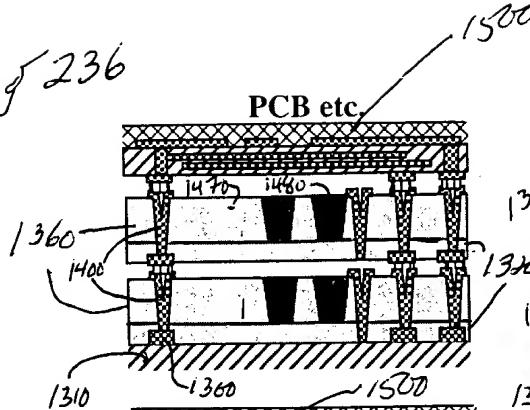


Fig 237

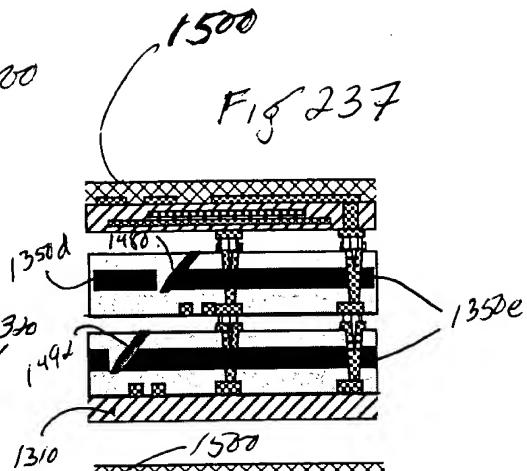


Fig 238

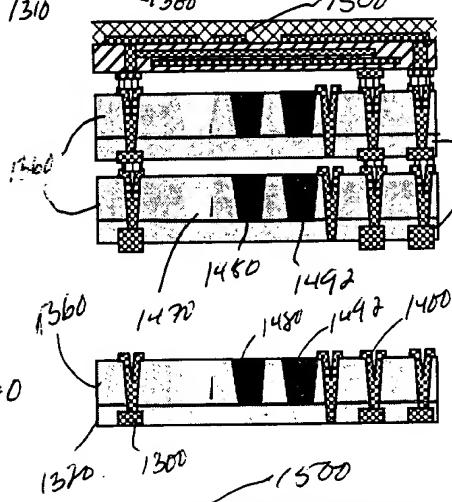


Fig 240

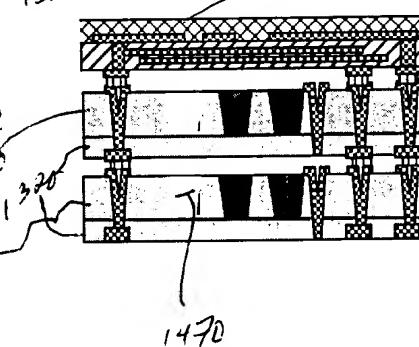


Fig 242

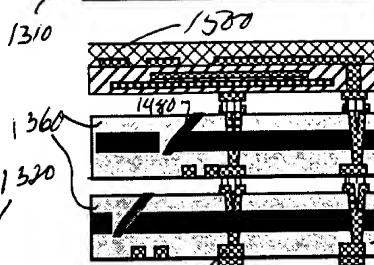
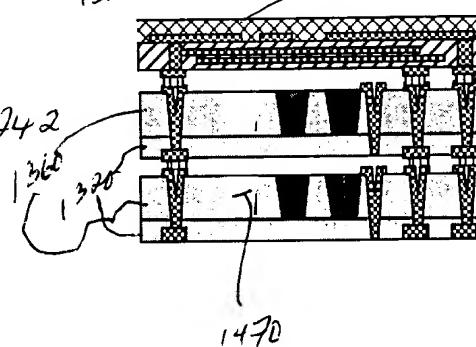


Fig 239

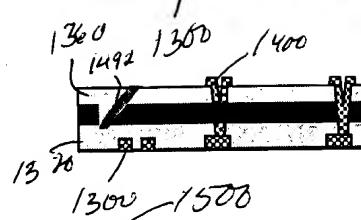


Fig 241

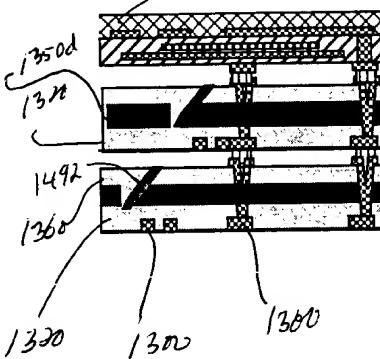


Fig 243

Fig 244

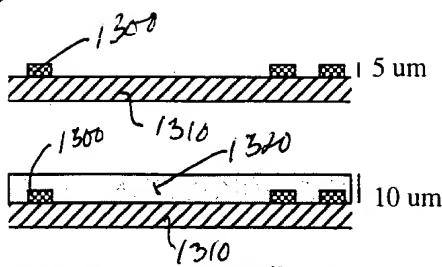


Fig 246

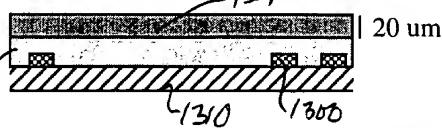


Fig 248

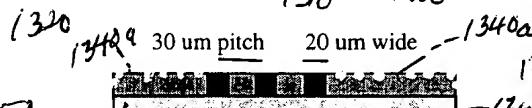


Fig 250

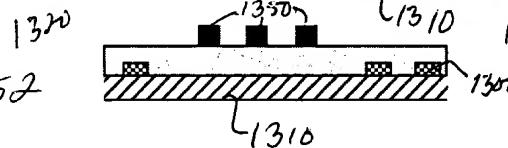


Fig 252

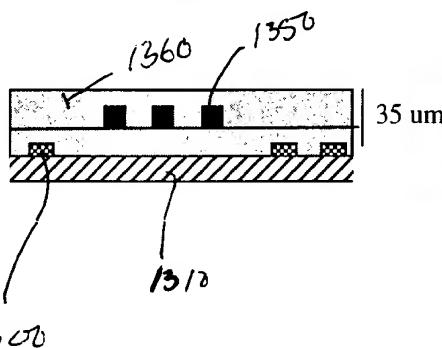


Fig 254

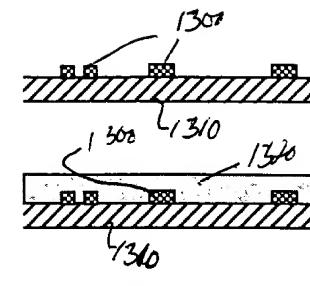


Fig 245

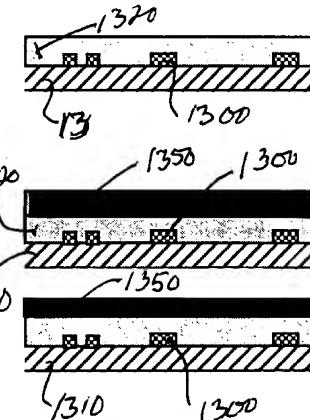


Fig 247

Fig 249

Fig 251

Fig 253

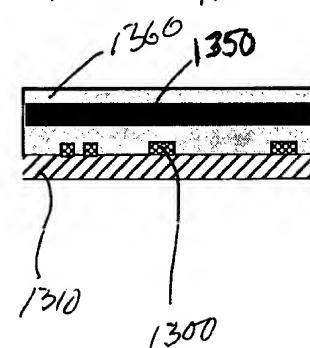
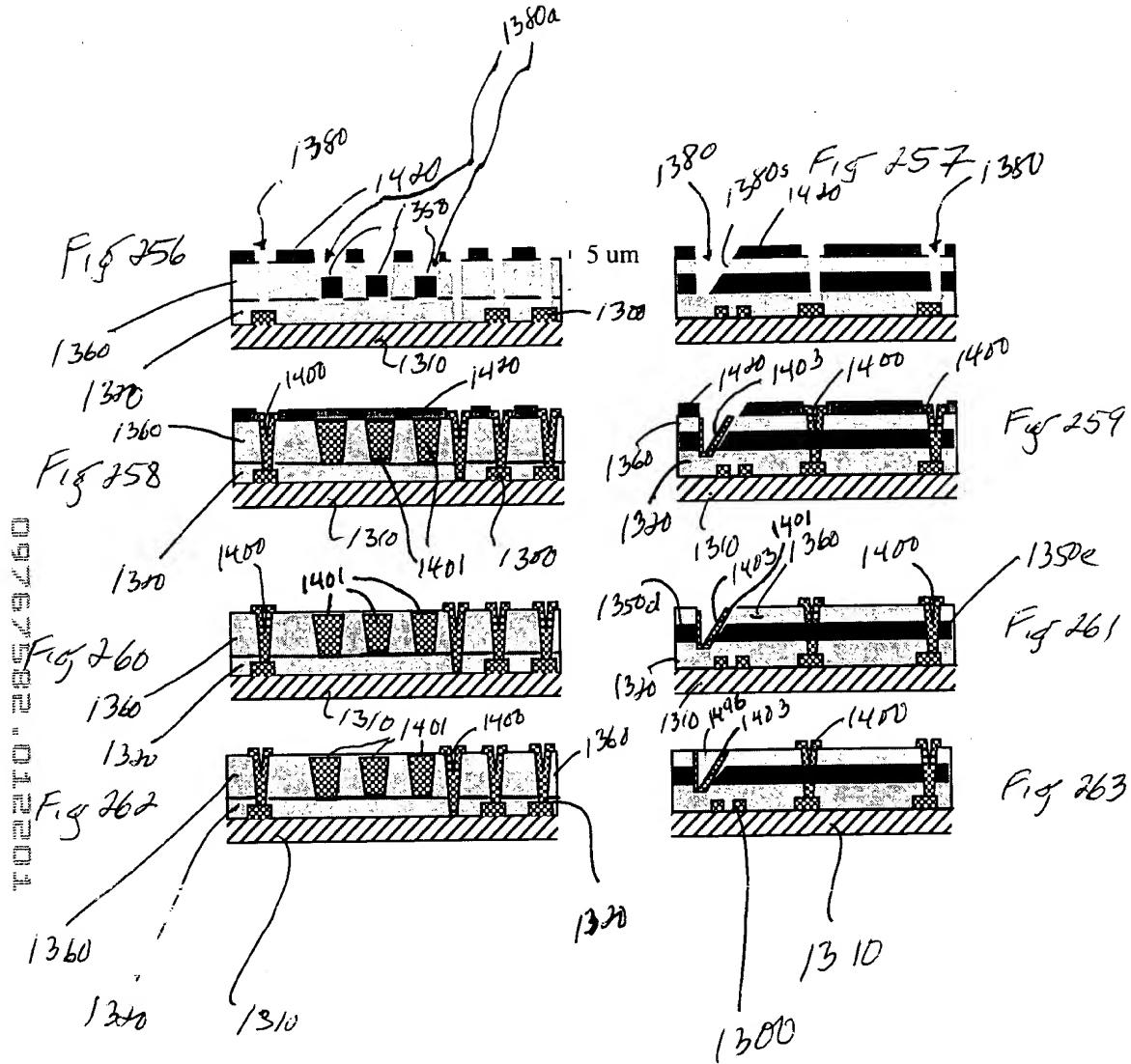
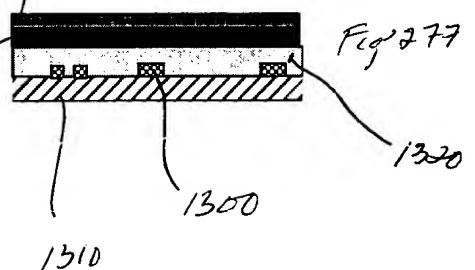
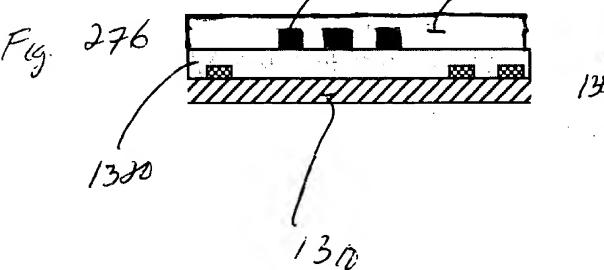
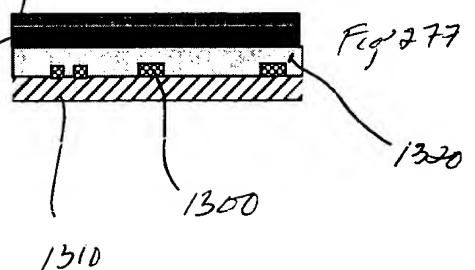
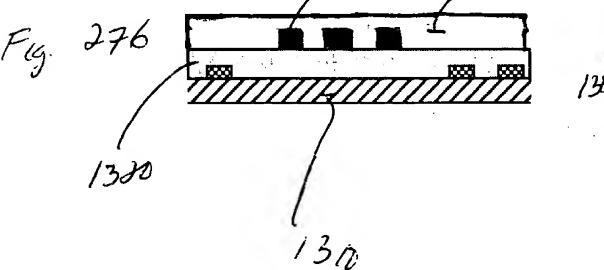
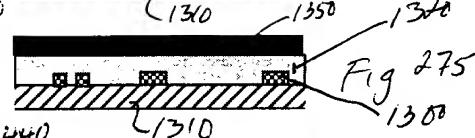
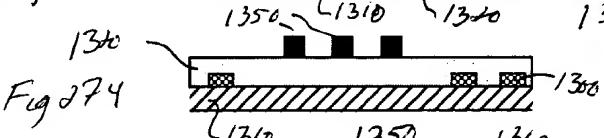
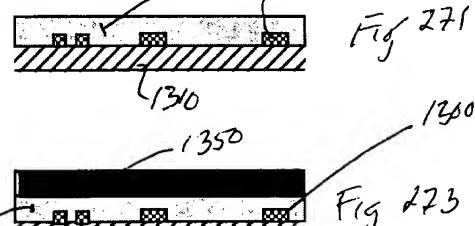
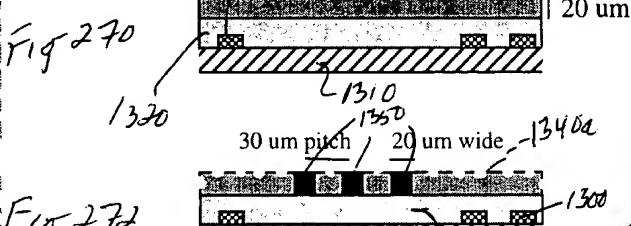
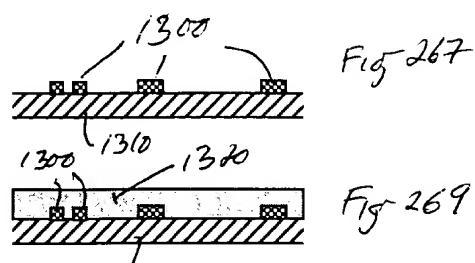
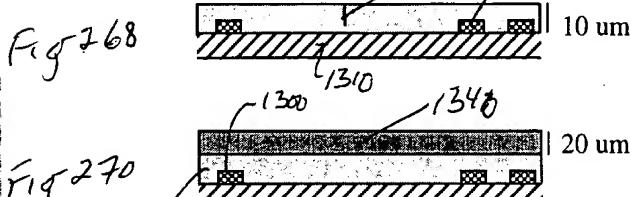
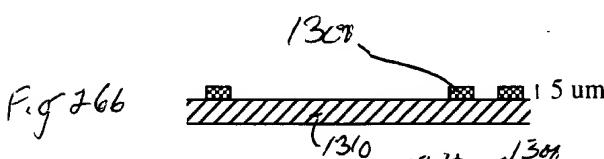
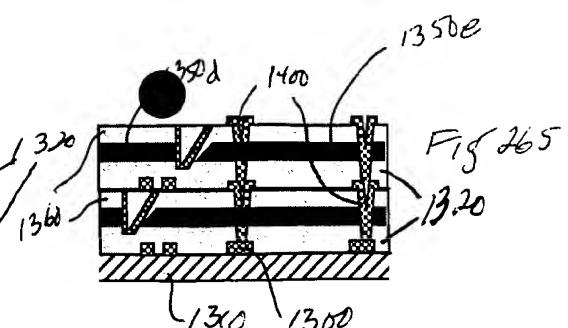
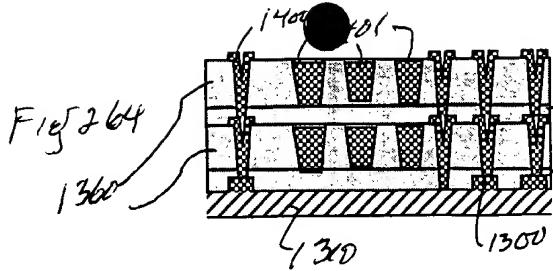
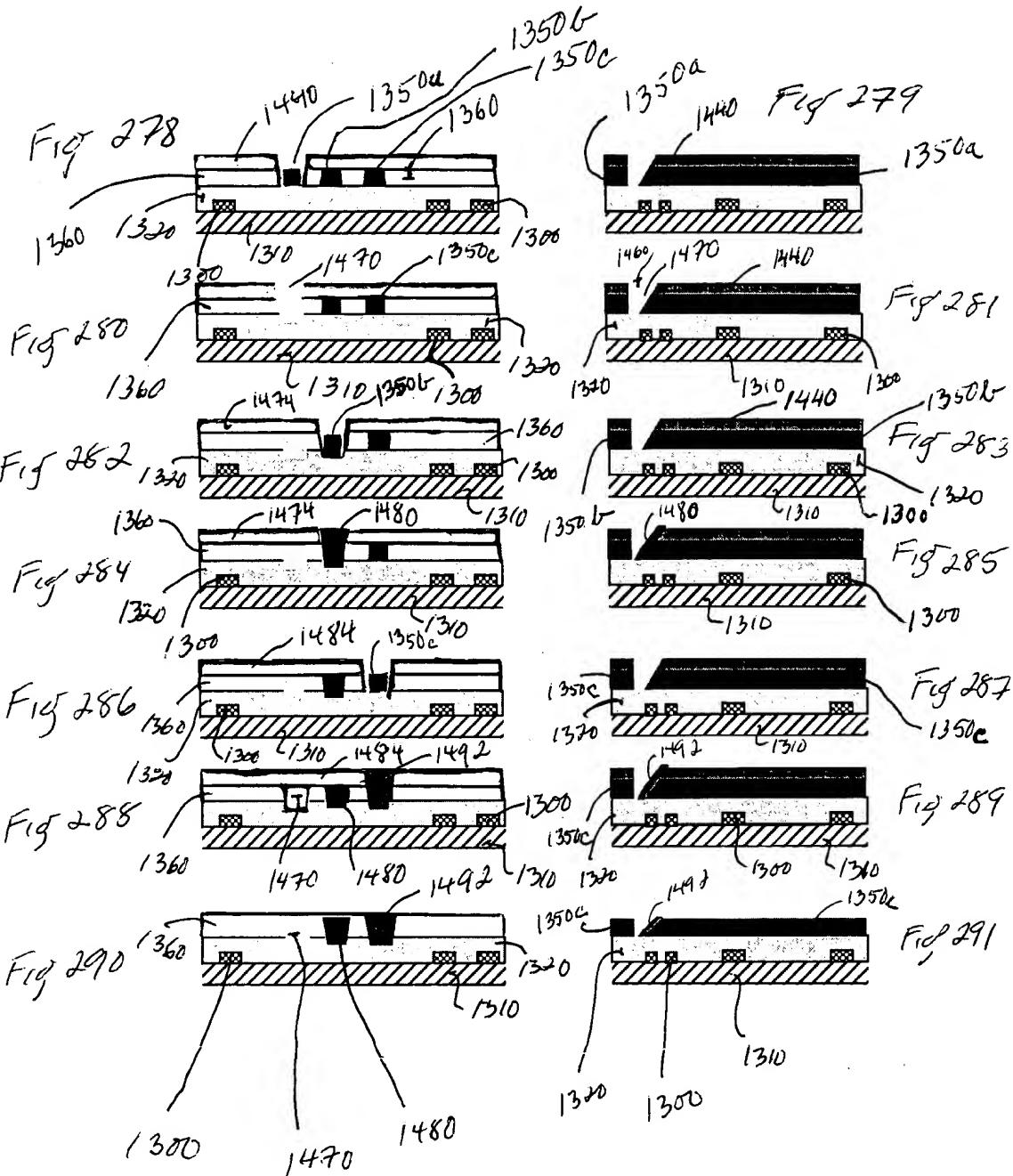


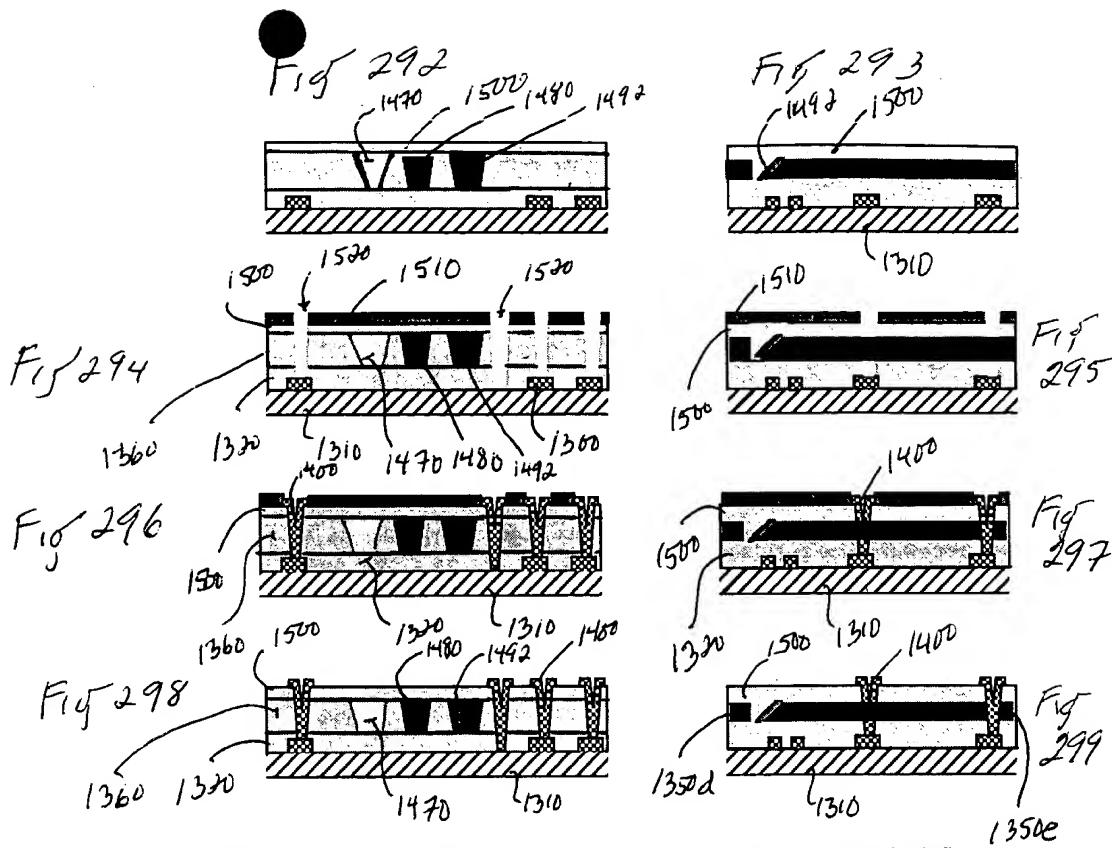
Fig 255



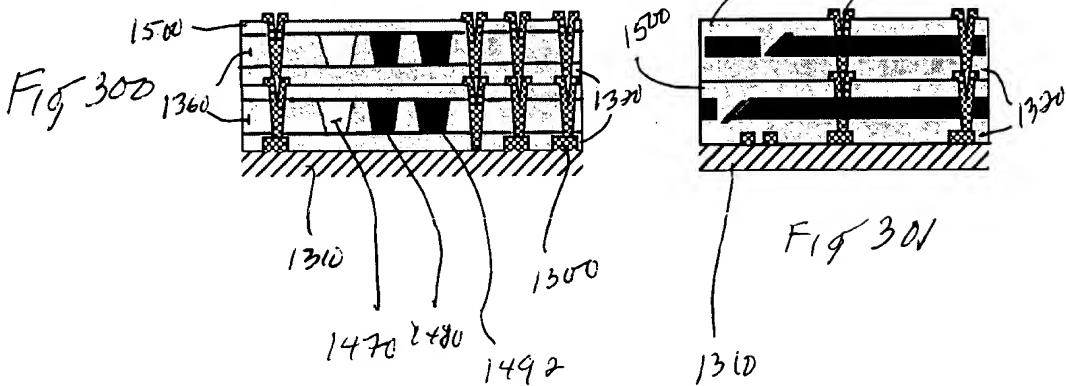
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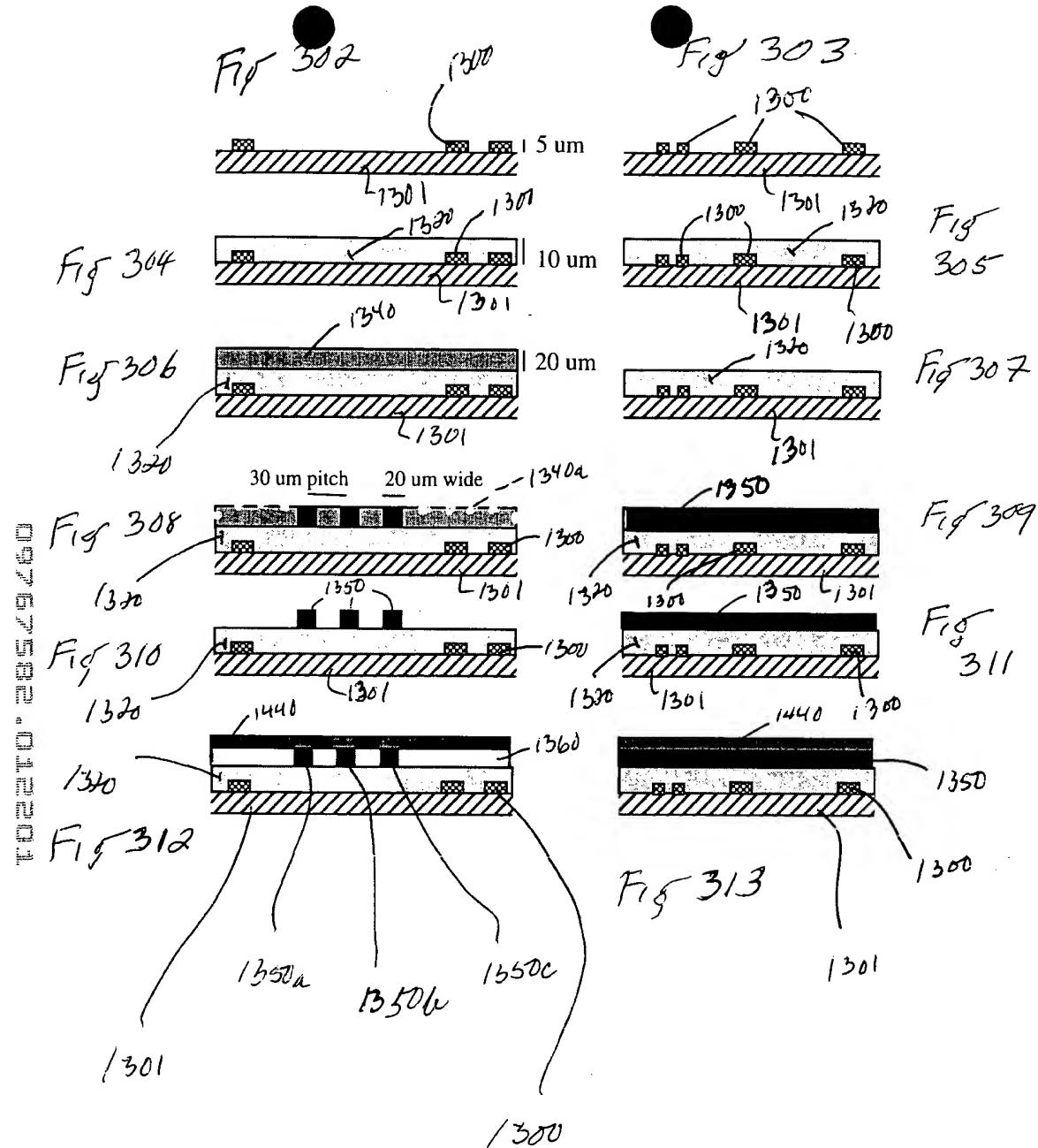




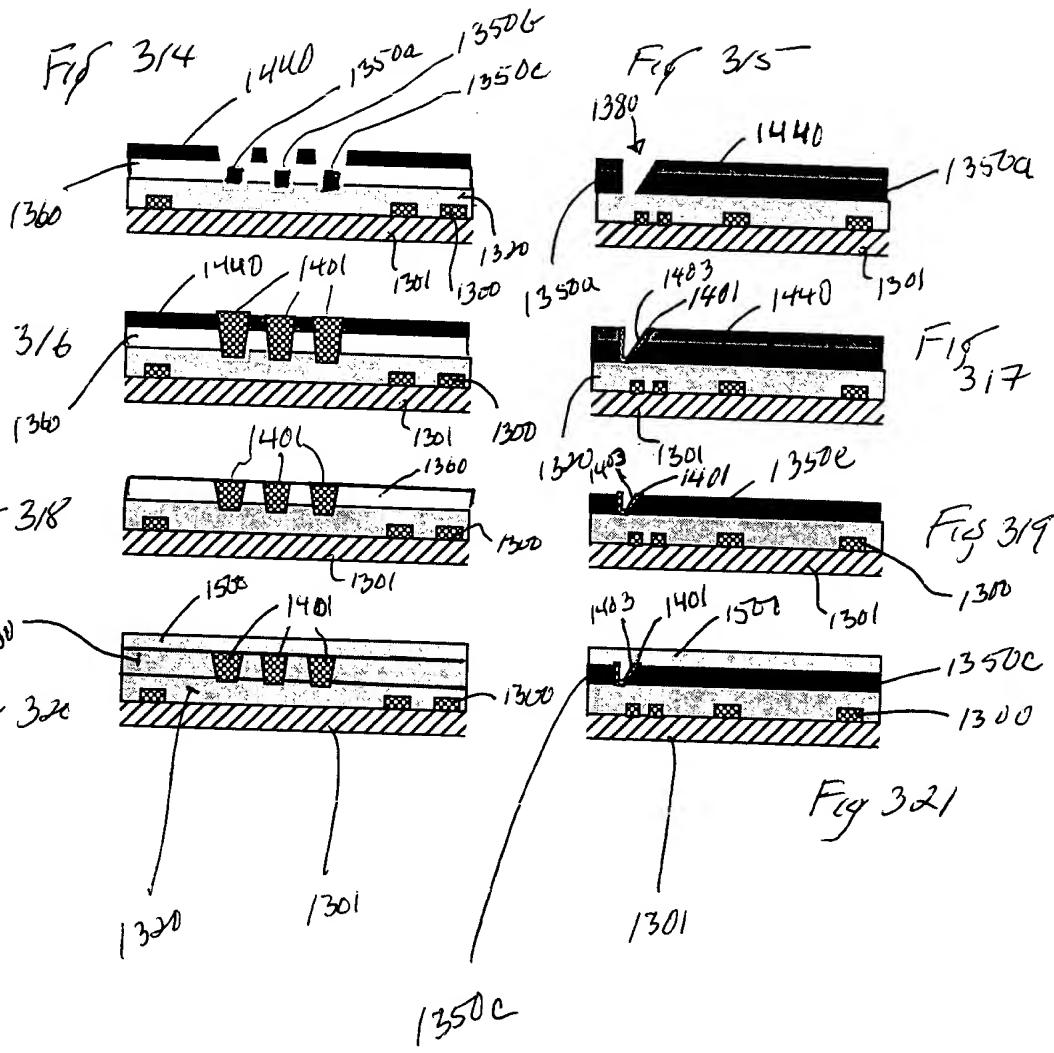


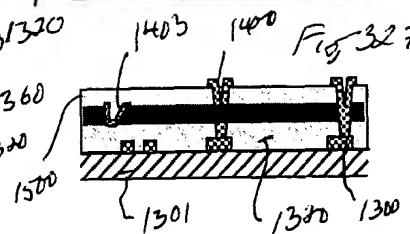
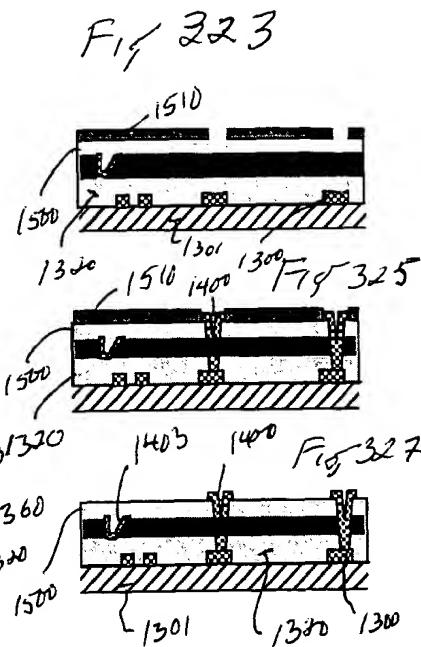
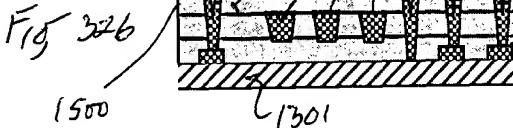
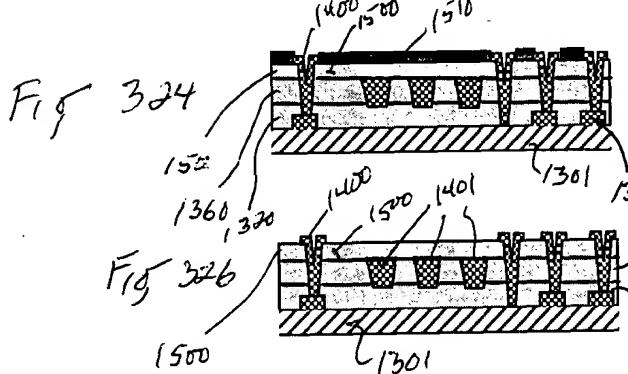
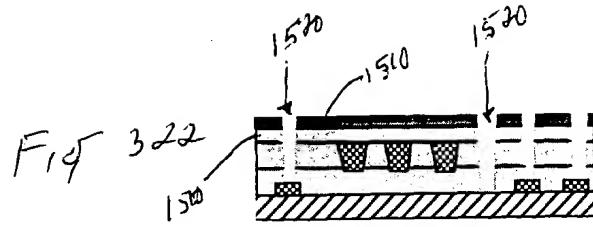
In the case of multi layer (a1-a16) process is repeated on the (a16).  
-it is also possible to repeat (a3-a16) or (a1, a3-a16)



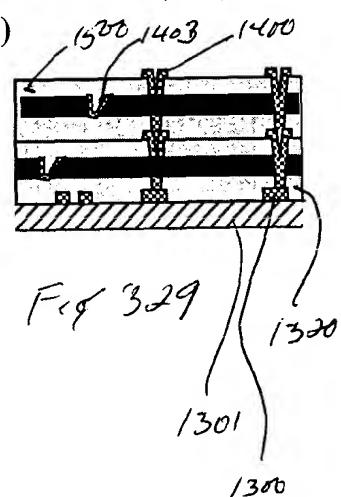
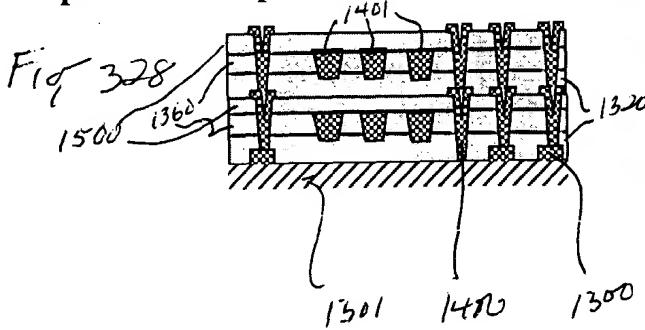


0097675682.012201

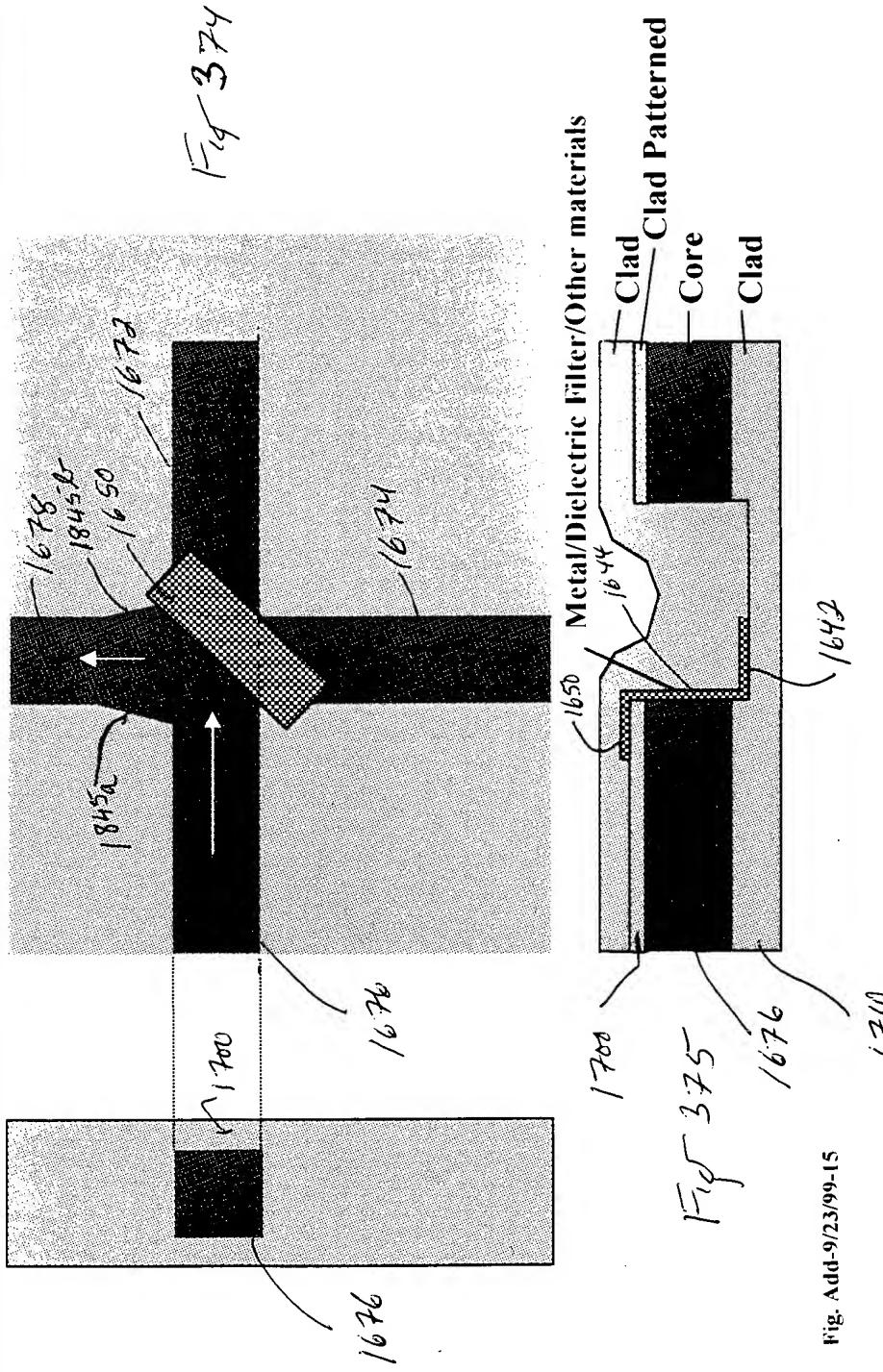




In the case of multi layer (a1-a12) process is repeated on the (a12).  
 -it is also possible to repeat (a3-a12) or (a1, a3-a12)

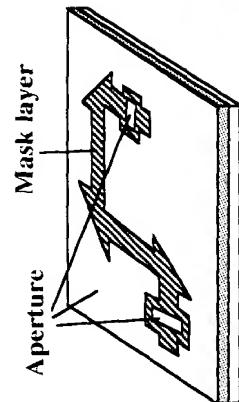


## Invented Corner Turning Structure (A)



## MNA, MNE Example for Add2 example

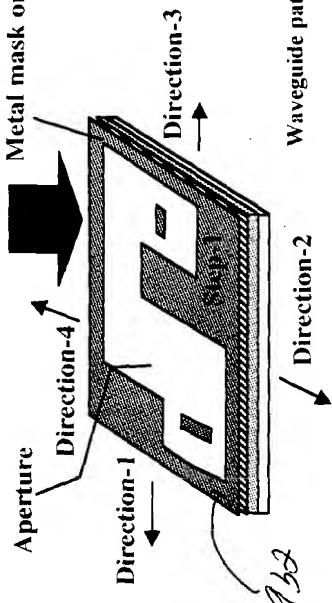
Fig 372



Excimer laser (or ion beam) with vertical incident angle

Aperture  
Direction-1  
Direction-2  
Direction-3  
Direction-4

Fig 371



Waveguide pattern

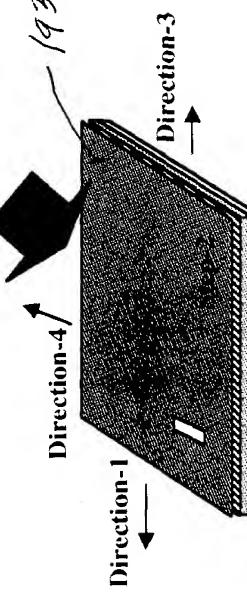
Direction-2  
Direction-3  
Direction-4

1932

Excimer laser (or ion beam) with tilted incident angle

Direction-4  
Direction-1  
Direction-2  
Direction-3

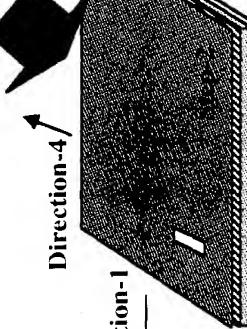
Fig 374



1934

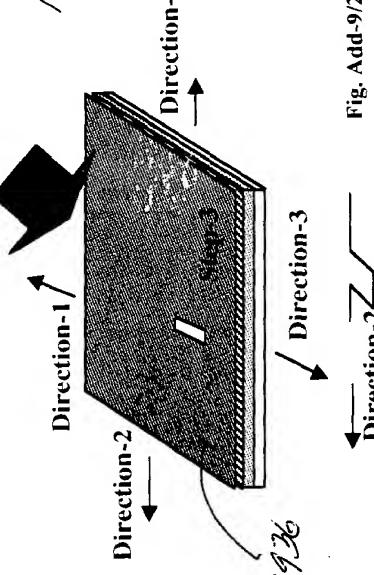
Direction-4  
Direction-1  
Direction-2  
Direction-3

Fig 372



Direction-1  
Direction-2  
Direction-3  
Direction-4

Fig 372



Direction-1  
Direction-2  
Direction-3  
Direction-4

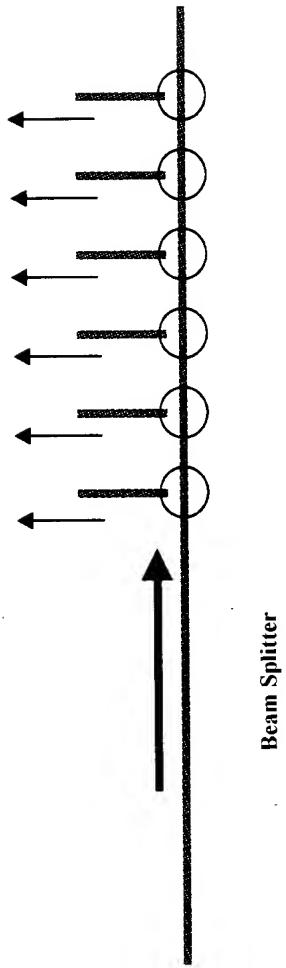
Fig 373

Fig 373

Fig. Add-9/23/99-10



## Excimer Laser Ablation Example for Beveled Cut (2)



Beam Splitter

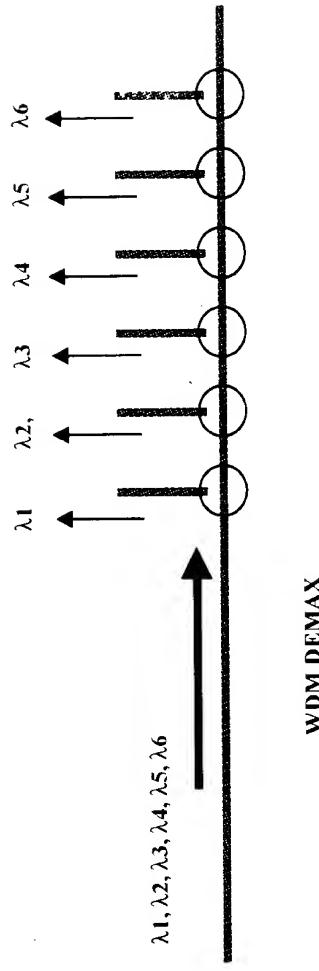
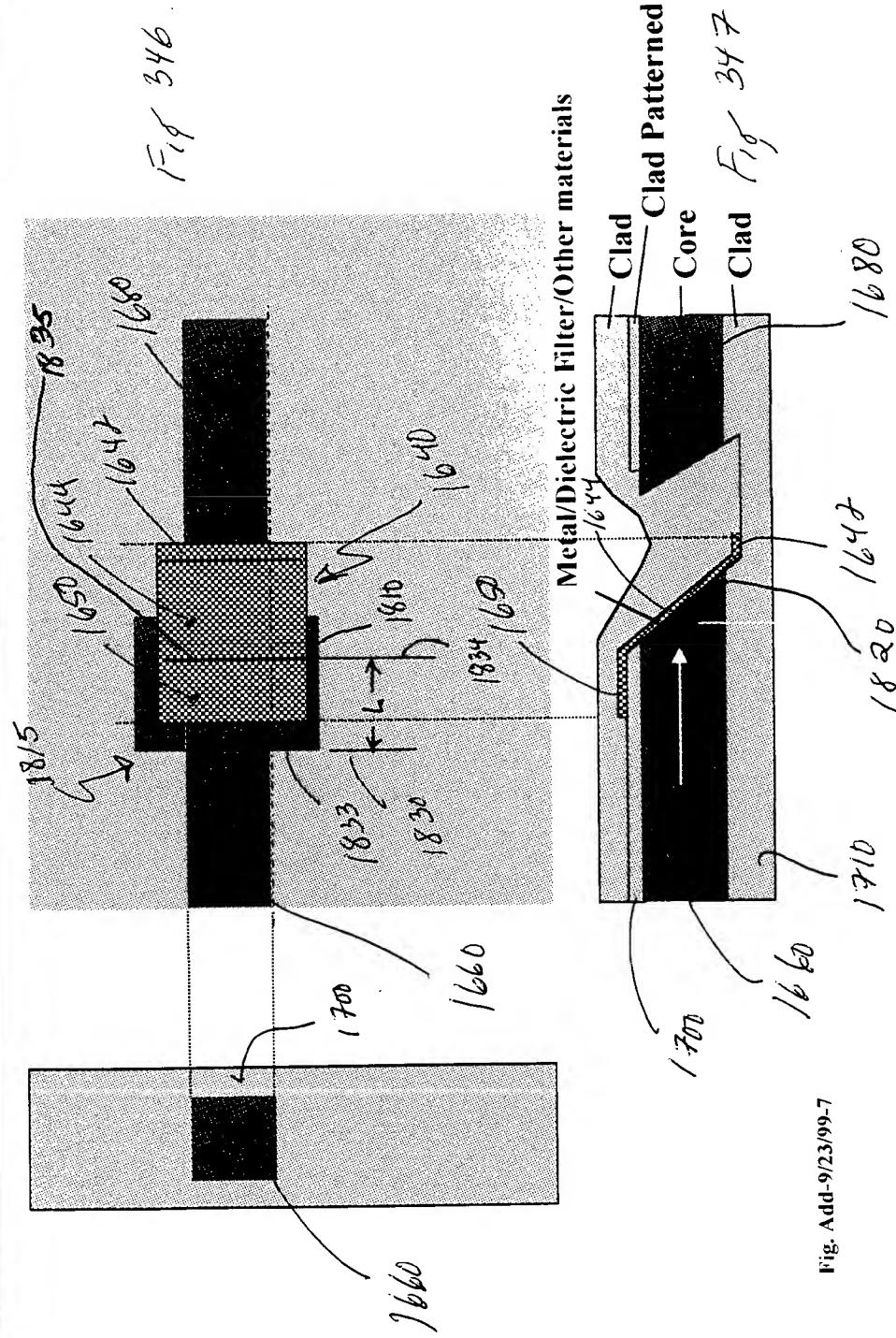


Fig. Add-9/23/99-8

Fig. 348

Fig. 349

## Invented Coupler Structure (II)



# Invented Coupler Structure (I)

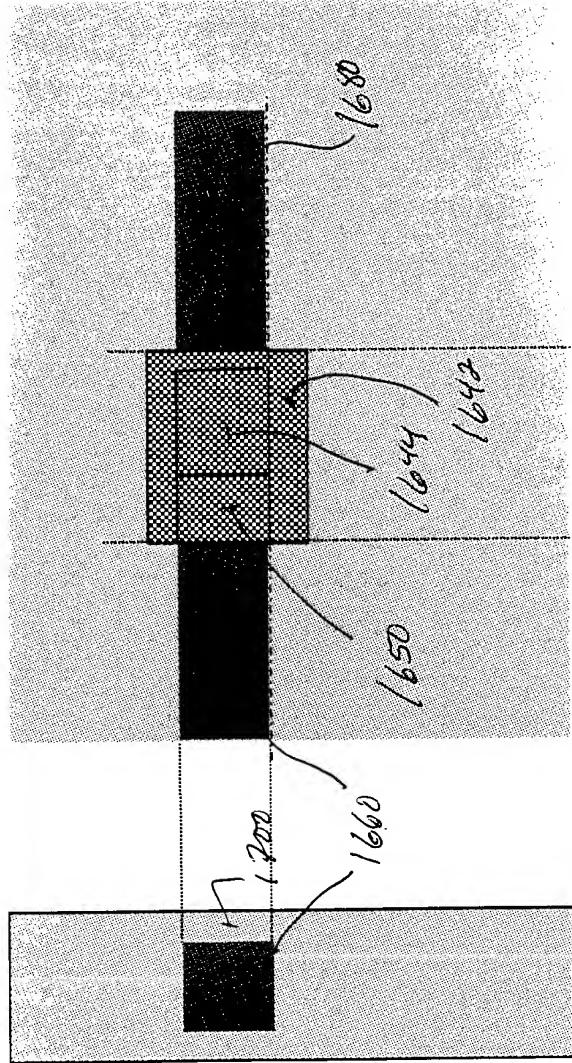


Fig 344

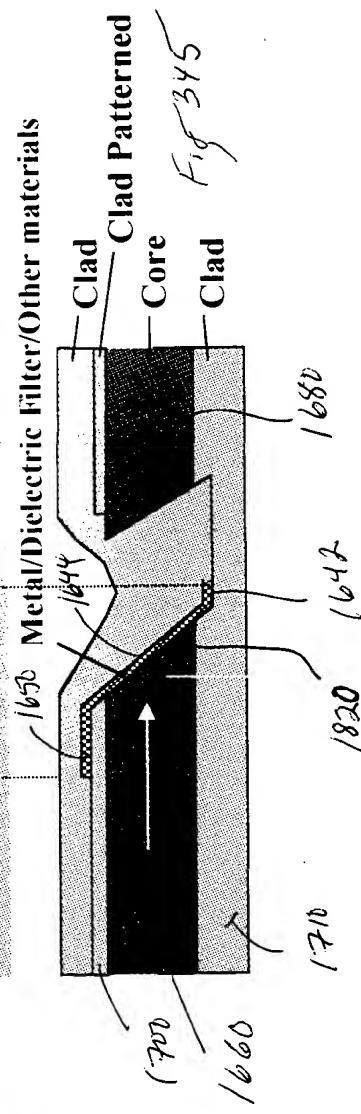


Fig 313

Fig. Add-9/23/99-6

## Conventional Coupler Structure (I)

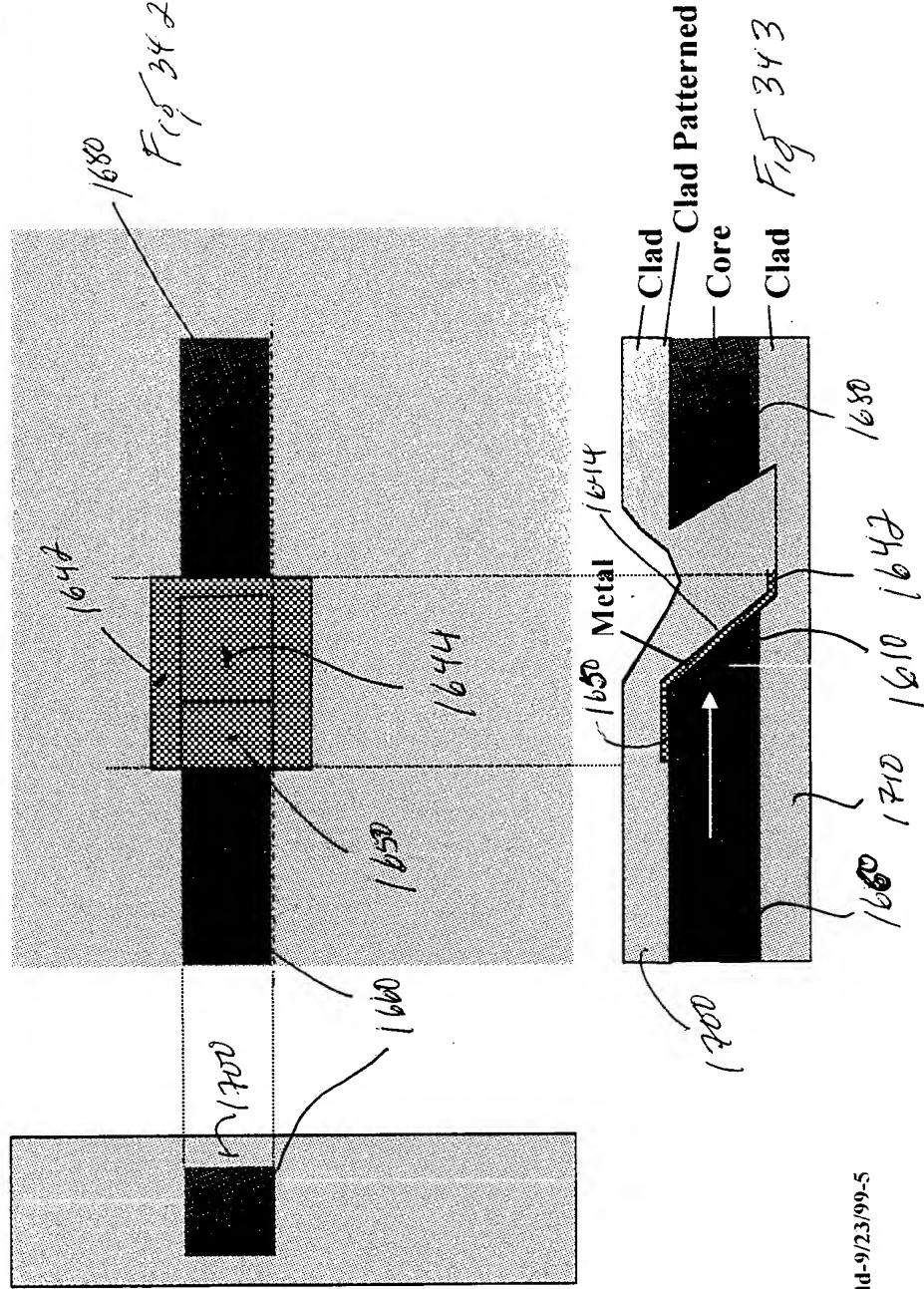
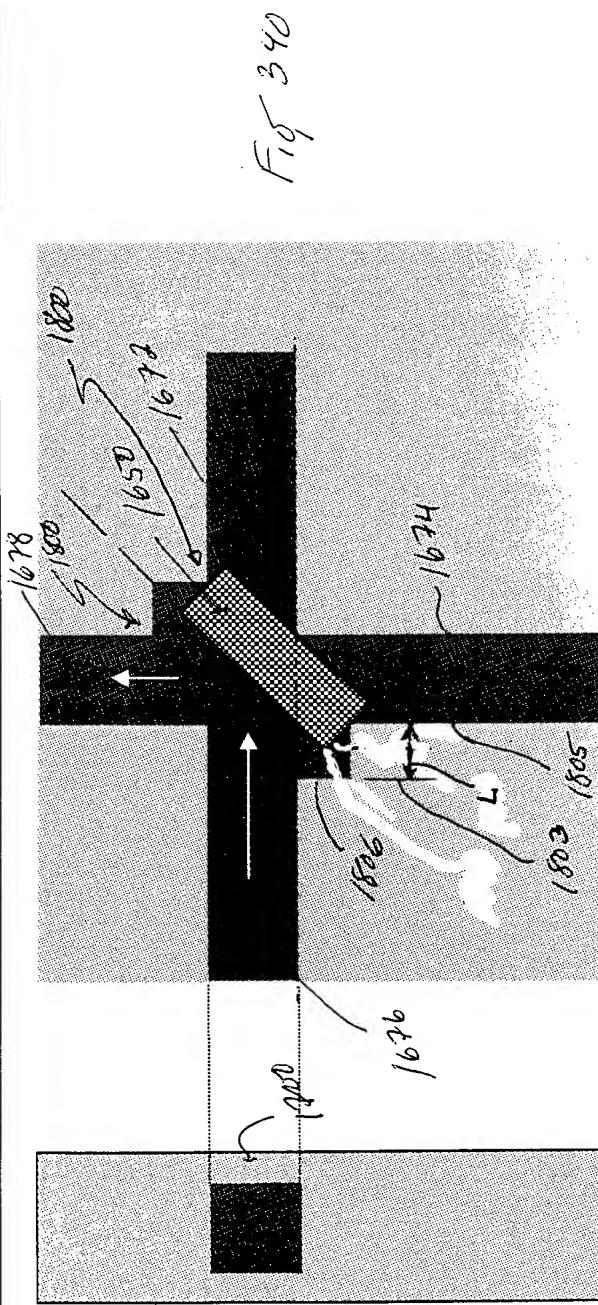


Fig. Add-9/23/99-5

## Invented Corner Turning Structure (II)



- 165 - Metal/Dielectric Filter/Other materials

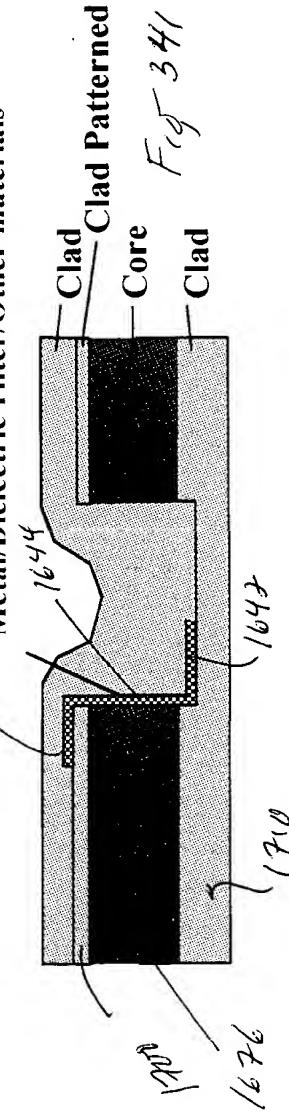


Fig. Add-9/23/99-4

## Invented Corner Turning Structure (I)

1678

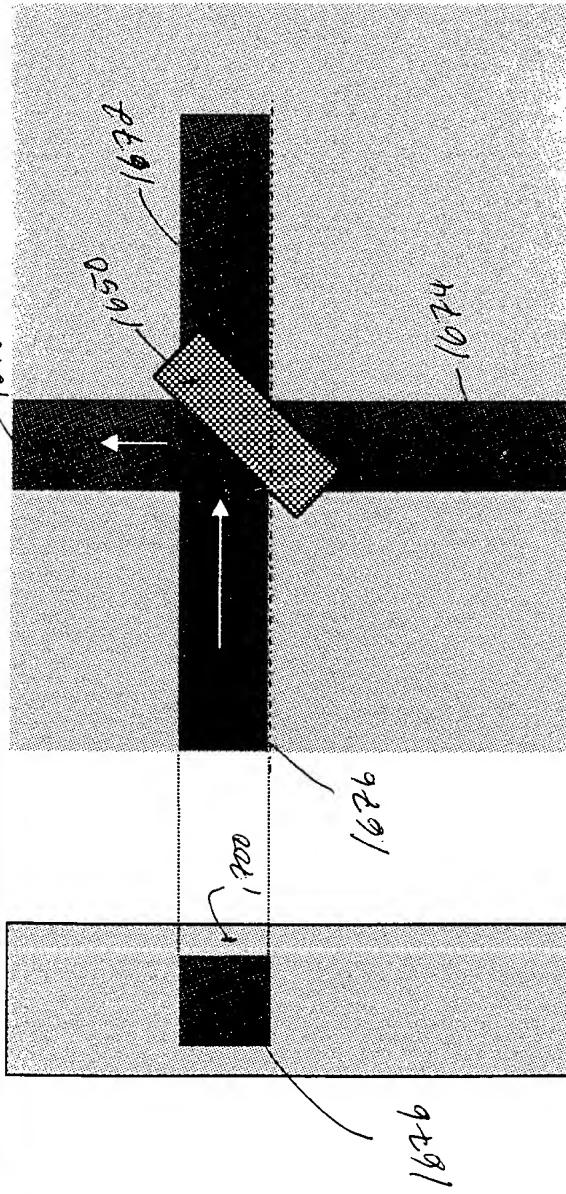


Fig. 338

1650

Metal/Dielectric Filter/Other materials

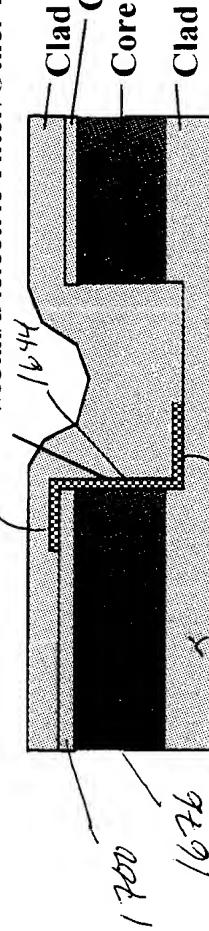


Fig. Add-9/23/99-3

1642 (1710)

Fig. 339

## Conventional Corner Turning Structure

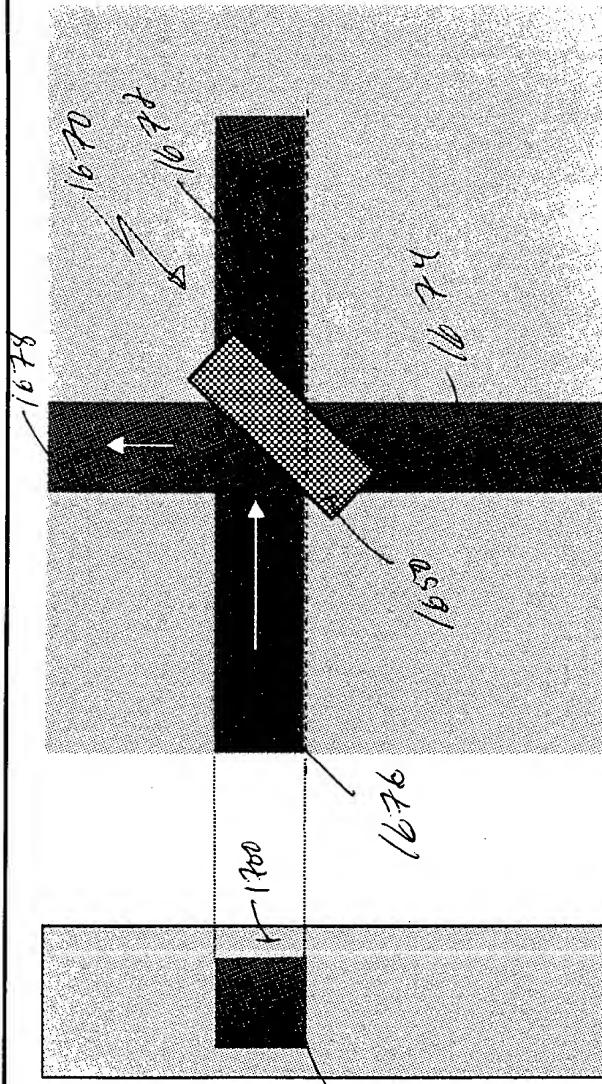


Fig 336  
1676

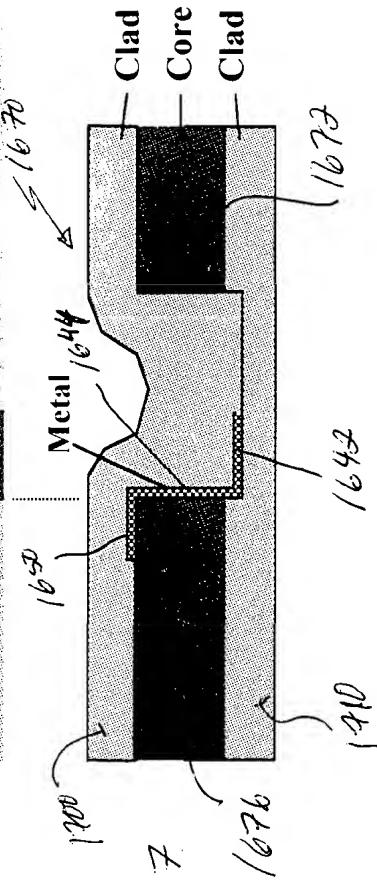


Fig 337  
1676

## Conventional and Invented Waveguide Structure Examples

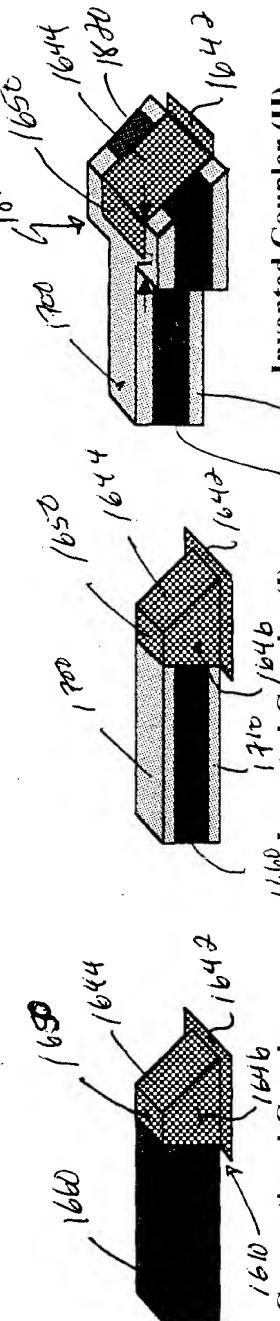
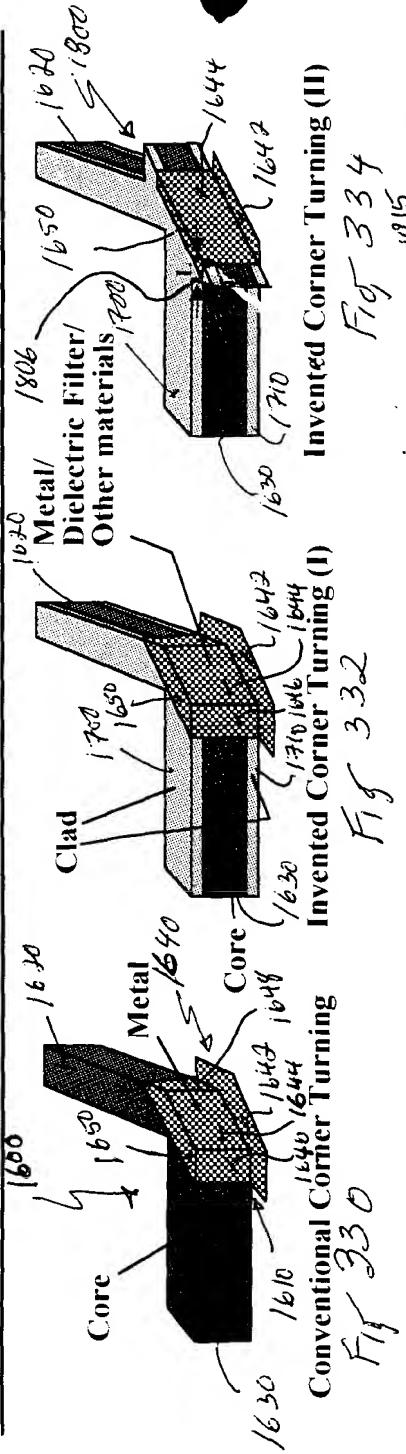
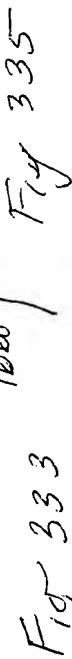


Fig. Add-9/23/99-1

(710)



(710)

## Example 3: Z waveguide Fab. Process 1

(a1) Metal pattern formation *Fig. 376*



(a2) Core coat9  
[DuPont, AlliedSig, ORMOCERS or F-PI]



(a3) Z-WG core patterning  
[UV-Exposure, mask-formation+RIE,  
Laser, or Dupont process]



(a4) Clad coat  
(for planarization viscosity adjust  
if necessary CMP)



(a5) Core coat  
[DuPont, AlliedSig, ORMOCERS or F-PI]



Development  
(for AlliedSig, ORMOCERS)



(a6) WG core patterning  
[UV-Exposure, mask-formation+RIE,  
Laser, or Dupont process]  
Development  
(for AlliedSig, ORMOCERS)

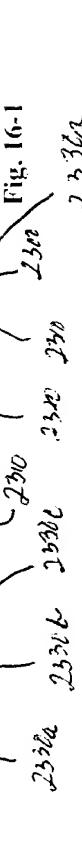
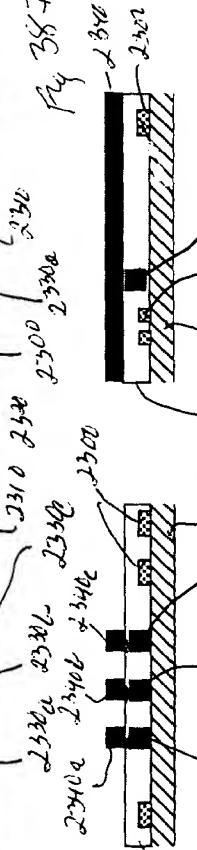
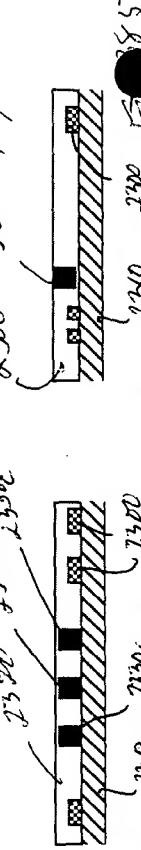


Fig. 377

Fig. 378

Fig. 379

Fig. 380

Fig. 381

Fig. 382

Fig. 383

Fig. 384

Fig. 385

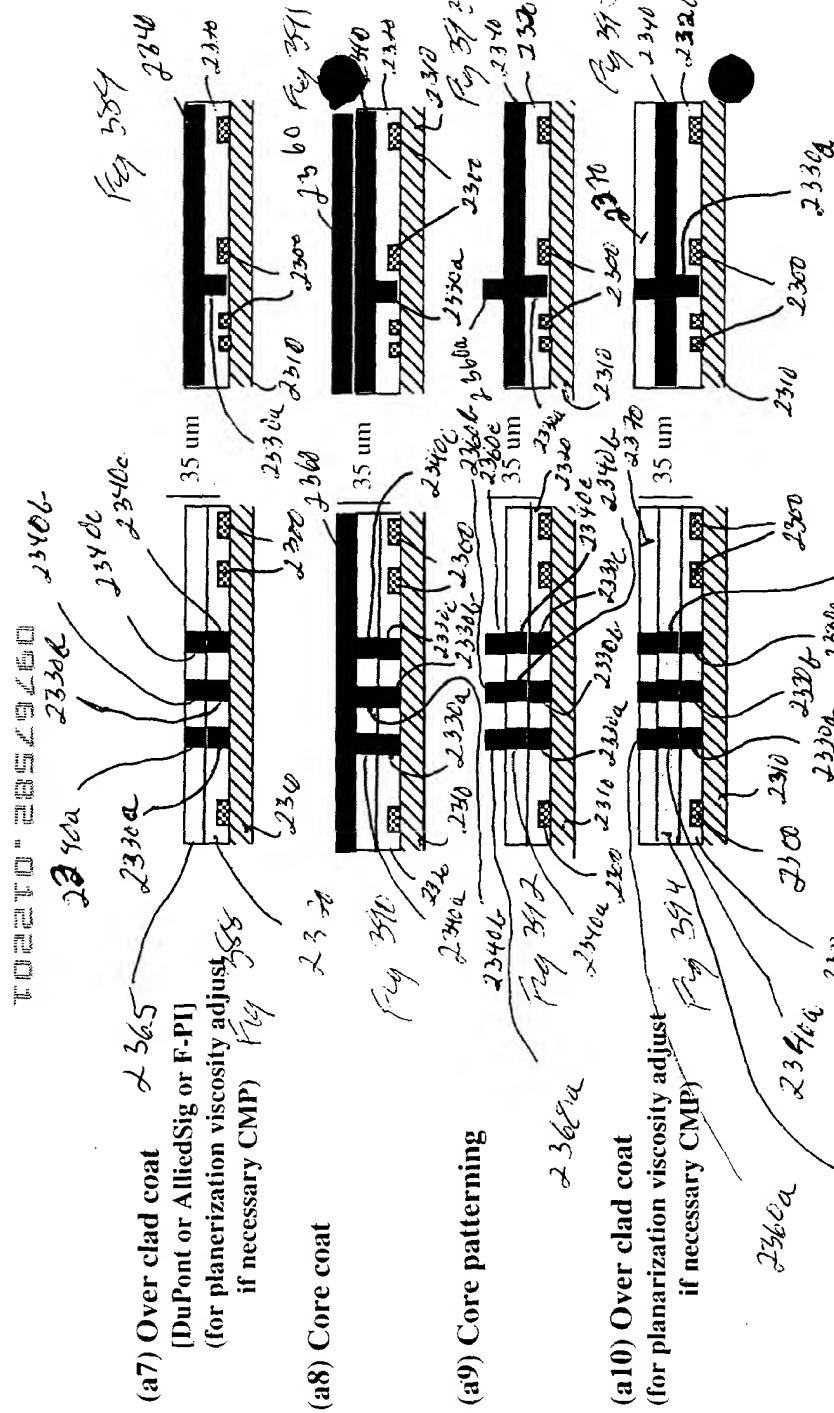
Fig. 386

Fig. 387

Fig. 388

Fig. 389

Fig. 16-1



In the case of multi layer (a1-a10) or (a2-a10) process is repeated on the (a10).

2.365

## Example 4: Z waveguide Fab. Process 2 Fig 397

(a1) Metal pattern formation Fig 396

(a2) Clad coat [DuPont, AlliedSig, ORMOCERs or F-PI] Fig 398

(a3) Clad patterning [UV-Exposure, mask-formation+RIE, Laser or Dupont process] Fig 400

Development (for AlliedSig, ORMOCERs)

(a4) Core coat Fig 402 (for planarization viscosity adjust if necessary CMP) Fig 403

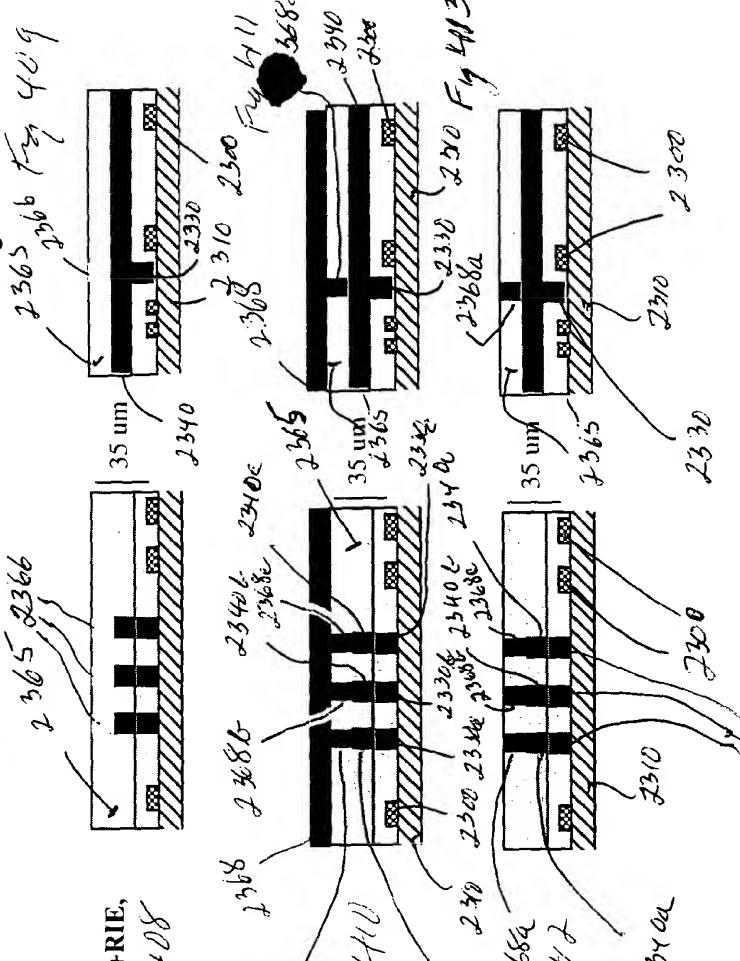
(a5) WG core patterning [UV-Exposure, mask-formation+RIE, Laser or Dupont process] Fig 404

Development (for AlliedSig, ORMOCERs)

(a6) Over clad coat [DuPont or AlliedSig or F-PI] (for planerization viscosity adjust if necessary CMP) Fig 407

<img alt="A series of six cross-sectional diagrams showing the fabrication steps for a Z-waveguide. 1. Metal pattern formation: A hatched layer with a central rectangular opening. 2. Clad coat: A thin black layer on top. 3. Clad patterning: A second hatched layer with a central rectangular opening, aligned with the first. 4. Core coat: A thick black layer on top, with a central rectangular opening. 5. WG core patterning: A third hatched layer with a central rectangular opening, aligned with the previous ones. 6. Over clad coat: A thick black layer on top, with a central rectangular opening. Each diagram is labeled with various process steps and figures (e.g., 396, 398, 400, 402, 403, 404, 405, 407) and specific dimensions like 2300, 2310, 2320, 2330, 2340, 2350, 2360, 2370, 2380, 2390, 2395, 2400, 2410, 2420, 2430, 2440, 2450, 2460, 2470, 2480, 2490, 2500, 2510, 2520, 2530, 2540, 2550, 2560, 2570, 2580, 2590, 2595, 2600, 2610, 2620, 2630, 2640, 2650, 2660, 2670, 2680, 2690, 2700, 2710, 2720, 2730, 2740, 2750, 2760, 2770, 2780, 2790, 2800, 2810, 2820, 2830, 2840, 2850, 2860, 2870, 2880, 2890, 2900, 2910, 2920, 2930, 2940, 2950, 2960, 2970, 2980, 2990, 2995, 3000, 3010, 3020, 3030, 3040, 3050, 3060, 3070, 3080, 3090, 3095, 3100, 3110, 3120, 3130, 3140, 3150, 3160, 3170, 3180, 3190, 3195, 3200, 3210, 3220, 3230, 3240, 3250, 3260, 3270, 3280, 3290, 3295, 3300, 3310, 3320, 3330, 3340, 3350, 3360, 3370, 3380, 3390, 3395, 3400, 3410, 3420, 3430, 3440, 3450, 3460, 3470, 3480, 3490, 3495, 3500, 3510, 3520, 3530, 3540, 3550, 3560, 3570, 3580, 3590, 3595, 3600, 3610, 3620, 3630, 3640, 3650, 3660, 3670, 3680, 3690, 3695, 3700, 3710, 3720, 3730, 3740, 3750, 3760, 3770, 3780, 3790, 3795, 3800, 3810, 3820, 3830, 3840, 3850, 3860, 3870, 3880, 3890, 3895, 3900, 3910, 3920, 3930, 3940, 3950, 3960, 3970, 3980, 3990, 3995, 4000, 4010, 4020, 4030, 4040, 4050, 4060, 4070, 4080, 4090, 4095, 4100, 4110, 4120, 4130, 4140, 4150, 4160, 4170, 4180, 4190, 4195, 4200, 4210, 4220, 4230, 4240, 4250, 4260, 4270, 4280, 4290, 4295, 4300, 4310, 4320, 4330, 4340, 4350, 4360, 4370, 4380, 4390, 4395, 4400, 4410, 4420, 4430, 4440, 4450, 4460, 4470, 4480, 4490, 4495, 4500, 4510, 4520, 4530, 4540, 4550, 4560, 4570, 4580, 4590, 4595, 4600, 4610, 4620, 4630, 4640, 4650, 4660, 4670, 4680, 4690, 4695, 4700, 4710, 4720, 4730, 4740, 4750, 4760, 4770, 4780, 4790, 4795, 4800, 4810, 4820, 4830, 4840, 4850, 4860, 4870, 4880, 4890, 4895, 4900, 4910, 4920, 4930, 4940, 4950, 4960, 4970, 4980, 4990, 4995, 5000, 5010, 5020, 5030, 5040, 5050, 5060, 5070, 5080, 5090, 5095, 5100, 5110, 5120, 5130, 5140, 5150, 5160, 5170, 5180, 5190, 5195, 5200, 5210, 5220, 5230, 5240, 5250, 5260, 5270, 5280, 5290, 5295, 5300, 5310, 5320, 5330, 5340, 5350, 5360, 5370, 5380, 5390, 5395, 5400, 5410, 5420, 5430, 5440, 5450, 5460, 5470, 5480, 5490, 5495, 5500, 5510, 5520, 5530, 5540, 5550, 5560, 5570, 5580, 5590, 5595, 5600, 5610, 5620, 5630, 5640, 5650, 5660, 5670, 5680, 5690, 5695, 5700, 5710, 5720, 5730, 5740, 5750, 5760, 5770, 5780, 5790, 5795, 5800, 5810, 5820, 5830, 5840, 5850, 5860, 5870, 5880, 5890, 5895, 5900, 5910, 5920, 5930, 5940, 5950, 5960, 5970, 5980, 5990, 5995, 6000, 6010, 6020, 6030, 6040, 6050, 6060, 6070, 6080, 6090, 6095, 6100, 6110, 6120, 6130, 6140, 6150, 6160, 6170, 6180, 6190, 6195, 6200, 6210, 6220, 6230, 6240, 6250, 6260, 6270, 6280, 6290, 6295, 6300, 6310, 6320, 6330, 6340, 6350, 6360, 6370, 6380, 6390, 6395, 6400, 6410, 6420, 6430, 6440, 6450, 6460, 6470, 6480, 6490, 6495, 6500, 6510, 6520, 6530, 6540, 6550, 6560, 6570, 6580, 6590, 6595, 6600, 6610, 6620, 6630, 6640, 6650, 6660, 6670, 6680, 6690, 6695, 6700, 6710, 6720, 6730, 6740, 6750, 6760, 6770, 6780, 6790, 6795, 6800, 6810, 6820, 6830, 6840, 6850, 6860, 6870, 6880, 6890, 6895, 6900, 6910, 6920, 6930, 6940, 6950, 6960, 6970, 6980, 6990, 6995, 7000, 7010, 7020, 7030, 7040, 7050, 7060, 7070, 7080, 7090, 7095, 7100, 7110, 7120, 7130, 7140, 7150, 7160, 7170, 7180, 7190, 7195, 7200, 7210, 7220, 7230, 7240, 7250, 7260, 7270, 7280, 7290, 7295, 7300, 7310, 7320, 7330, 7340, 7350, 7360, 7370, 7380, 7390, 7395, 7400, 7410, 7420, 7430, 7440, 7450, 7460, 7470, 7480, 7490, 7495, 7500, 7510, 7520, 7530, 7540, 7550, 7560, 7570, 7580, 7590, 7595, 7600, 7610, 7620, 7630, 7640, 7650, 7660, 7670, 7680, 7690, 7695, 7700, 7710, 7720, 7730, 7740, 7750, 7760, 7770, 7780, 7790, 7795, 7800, 7810, 7820, 7830, 7840, 7850, 7860, 7870, 7880, 7890, 7895, 7900, 7910, 7920, 7930, 7940, 7950, 7960, 7970, 7980, 7990, 7995, 8000, 8010, 8020, 8030, 8040, 8050, 8060, 8070, 8080, 8090, 8095, 8100, 8110, 8120, 8130, 8140, 8150, 8160, 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(a7) Clad patterning  
[UV-Exposure, mask-formation+RIE,  
Laser or Dupont process] *Fig. 408*  
Development  
(for AlliedSig, ORMOCERs)



(a8) Core coat  
(for planarization viscosity adjust  
if necessary CMP)  
or

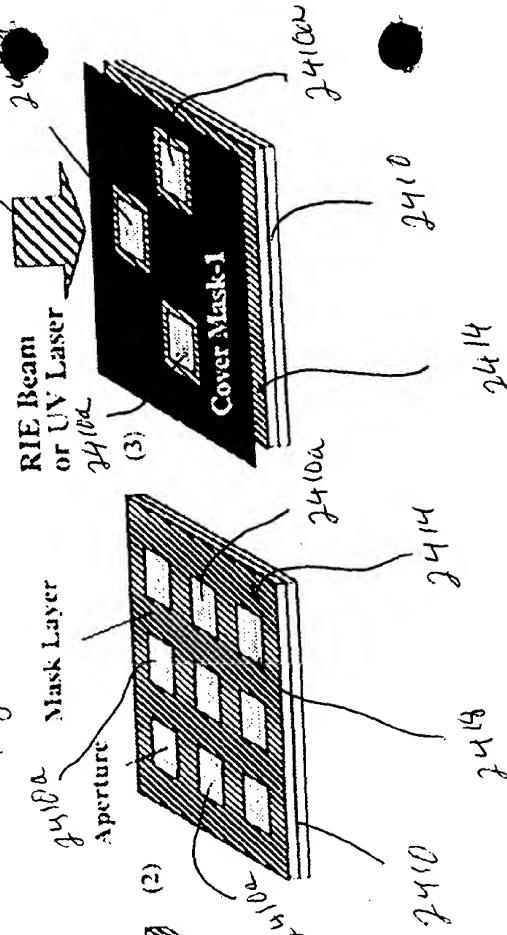
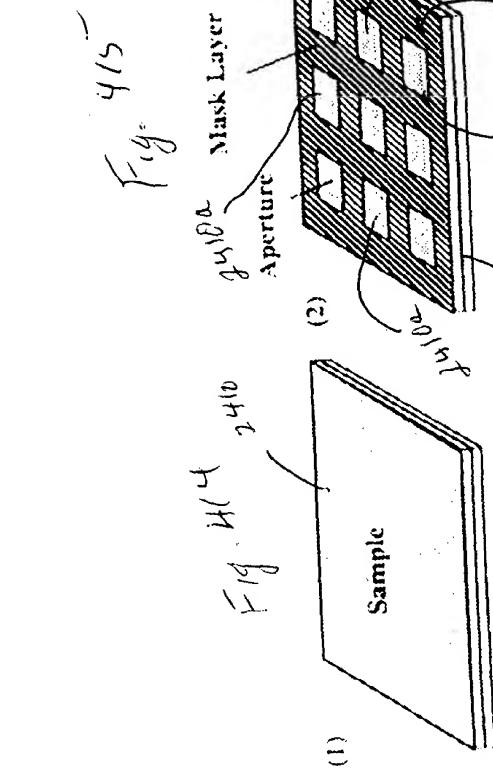
(a8) Core coat and CMP  
*Fig. 412*

2368  
2368a



In the case of multi layer (a1, a5-a8) or (a5-a8) process is repeated on the (a8).

Y02270 "285<9<160



ロシアアカデミー

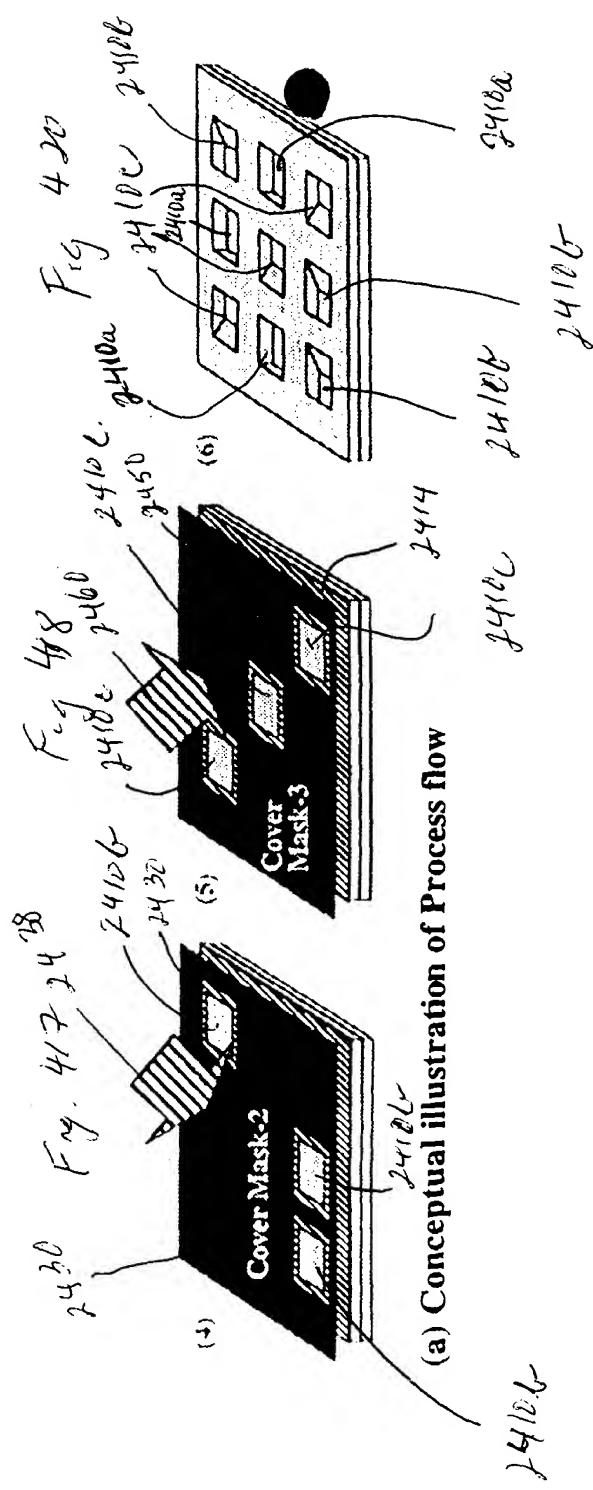
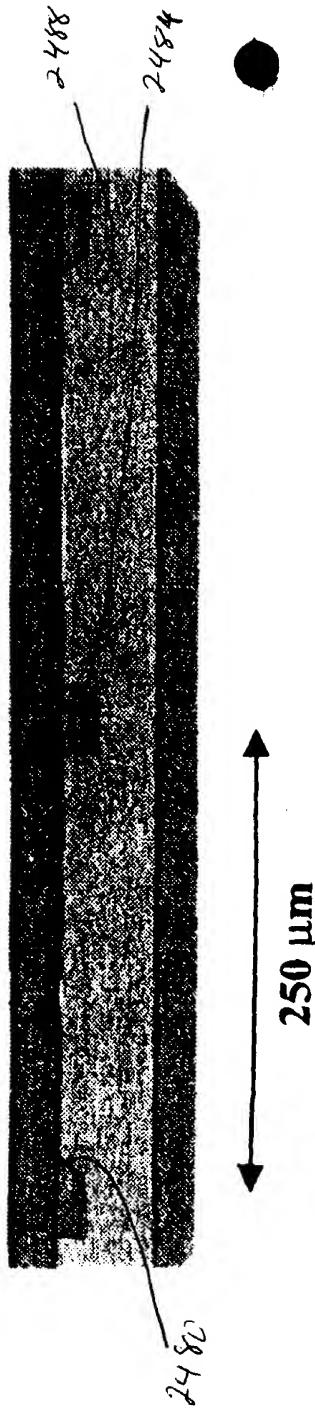


Fig. 4.11



(b) Trench wall formation of three different angles